New Generation of Integrated Software

INPUT®

NEW GENERATION OF INTEGRATED SOFTWARE

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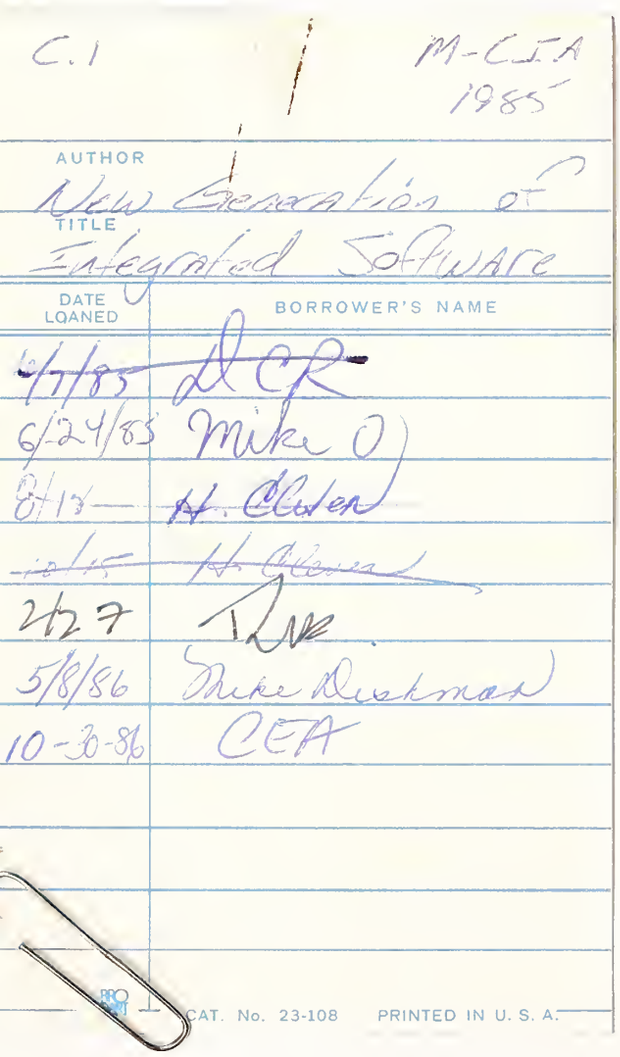

EXHIBITS

I INTRODUCTION

- This study was produced by INPUT as part of the Personal Computer Software program in the 1985 Market Analysis and Planning Service (MAPS) for the information services industry.

- This area of research was selected because of high client interest. The subject of the report, integrated software, is deserving of research and analysis because:

  - Integrated software in its present form is a new and exciting category of product.

  - Moreover, future generations of integrated software will incorporate developments that occur in the overall personal computer industry.

  - Integrated software today has a very high profile because of extensive media coverage, scores of new vendors, and advertisements on TV and in many major magazines and newspapers.

A. REPORT SCOPE AND OBJECTIVES

- INPUT's objective is to analyze current market conditions and vendor activities in order to identify key issues and trends that require vendor action.

Specific recommendations are included in this report to provide vendors with a framework for further analysis and investigation.

- The focus of this report is on personal computer integrated software for business use. The applications contained in the integrated software package must be for business productivity use.

- The report does not deal with Decision Support System issues or micro-mainframe issues. Decision Support System issues are discussed in an INPUT multiclient study entitled Decision Support Systems and Beyond. Similarly, micro-mainframe issues are dealt with in the INPUT report entitled Personal Computer Micro-Mainframe Trends and Opportunities.

B. REPORT METHODOLOGY

- For this report, 20 vendor interviews were conducted. In addition, a review of trade press literature and previous INPUT research was done, along with a search through INPUT's extensive vendor and industry files.

- Interviews were carried out in January and February of 1985.

- The interviews were used to gather data, opinions, and plans for the purpose of performing the analysis for this study. The interview technique included the use of many open-ended questions in an effort to provide INPUT clients with maximum information on the current thinking of involved participants.

- Prior to beginning the research, INPUT conducted interviews with numerous clients to solicit their thoughts on the details of the research and the key issues to be examined.

- Inquiries and comments on the information presented in this report are invited from clients.

C. DEFINITIONS

- Definitions of the three primary forms of integrated software are provided in Exhibit I-1.

- Varying approaches to integration exist. The ability to transfer data among applications is the primary basis for integrated software. This capability is useful because users often find it necessary to look at the same data in different ways or to combine information contained in different applications.

- The term "integrated software" can refer to several types of packages. They include:

  - All-in-one (also known as tightly integrated). An all-in-one package tightly combines several functions into a single package. Typical programs that are integrated include spreadsheets, word processors, and data base management systems. A tightly integrated package will have the following additional characteristics:

    . It is fully integrated; that is, it has the ability to share data without having to leave an active program, and without having to reformat data prior to data transfer.

    . It has a common command structure and user interface between different applications, eliminating the need for a user to learn one set of commands for a particular function and a separate set for another.

EXHIBIT I-1

DEFINITIONS OF INTEGRATED SOFTWARE

CATEGORY	DEFINITION	EXAMPLES
All-In-One, or Tightly Integrated	• Multiple Functions in One Program • Direct Transfer of Data • Common Command Structure • Windowing	• Framework (Ashton-Tate) • Symphony (Lotus)
Modularly Integrated, or Loosely Integrated	• Separate Programs Offered by One Vendor • Common Data Format • Similar User Interface • May Be Purchased Separately	• PFS: Series (Software Publishing Corp.) • Personal Decision Series (IBM) • Smart Series (Innovative Software)
Operating Environment	• Integrates Other Programs • Offers User-Friendly Interface • Windowing	• Topview (IBM) • Windows (Microsoft) • Desq (Quarterdeck)

- Modularly integrated (also known as loosely integrated or a product family). These are a series of separate programs from the same vendor that work as a set. That is, they share common data formats and user interfaces, as well as providing a means to move data among applications. Each package (spreadsheet, word processor, etc.) may be purchased separately.

- Operating environments (also known as an integrator, integrating package, application environment, system integrator, operating system extension, or window managers). Operating environments are programs that integrate other programs. They allow users to work with different and unique applications, and to exchange data among them.

II EXECUTIVE SUMMARY

- This executive summary is designed in a presentation format in order to:
  - Help the busy reader quickly review key research findings.
  - Provide a ready-to-go executive presentation, complete with a script to facilitate group communication.
- Key points of the report are summarized in Exhibits II-1 through II-5. Onthe left-hand page facing each exhibit is a script explaining the contents of the exhibit.

A. TRENDS IN INTEGRATED SOFTWARE

- Integrated software is defined as a program that combines several applications into one package, and provides a means for data transfer between applications.

- 1984 saw a proliferation of new all-in-one integrated software products. Accompanying this wave of product introductions was a feeling of excitement, followed by the inevitable letdown. Integration has proved itself to be a viable concept, but the ideal integrated software program has yet to be developed.

- New generations of integrated software will be developed that will improve upon current versions, thereby expanding the market for integrated software. Since none of the current products are likely to dominate in the future, there is a tremendous opportunity to develop products that fulfill the needs of tomorrow's users.

- The categories of the successful products of the future are described in Exhibit II-1. 1985 will see the release of a host of operating environment products, such as GEM, MS-Windows, Topview, and a number of Topview clones. 1986 will see the release of greater number of multiuser versions that will operate over a local area network (LAN).

- 1987 will see the emergence of ROM chips capable of storing an integrated software program. 1988 will see the widespread use of two-way bisynchronous micro-mainframe packages. 1989 will be the year that powerful artificial intelligence (AI) packages will be released in volume. Earlier versions will not be considered functional enough to be considered "true" AI.

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TRENDS IN INTEGRATED SOFTWARE

1984: Year of All-In-One Integrated Software

1985: Year of Windows and Operating Environments

1986: Year of Multiuser Versions

1987: Year of Integrated Software in ROM

1988: Year of Micro-Mainframe Integrated Software

1989: Year of AI-Based Integrated Software

B. INTEGRATED SOFTWARE TO BECOME STANDARD BY 1990

- Integrated software, in one form or another, will be standard by 1990. The projected shipments for integrated software are shown in Exhibit II-2. The forecast includes tightly integrated software (i.e., Framework, Symphony) for cross-industry applications, and operating environments (i.e., Topview, GEM) that are available for sale separately. The market for tightly integrated software will grow at a healthy rate until 1988, when the declining number of microcomputer sales will adversely impact software sales. The growth rate for operating environments will take off in two years, primarily due to operating environments having become part of the operating system by then.

- The trends spurring growth for tightly integrated software are:

  - Integrated software will become easier to use and more powerful.

  - Technology advances will lead to more powerful hardware that will be able to take advantage of integrated software.

- The factors limiting growth of tightly integrated software are:

  - Not everyone needs five applications.

  - Current packages are difficult to use.

  - Packages require costly additional hardware purchases.

  - Current hardware is not sufficiently powerful.

  - Competition from operating environments.

- Although operating environments will be in widespread use, there will still be a large market for tightly integrated packages, primarily because of the fuller integration a tightly integrated package offers.

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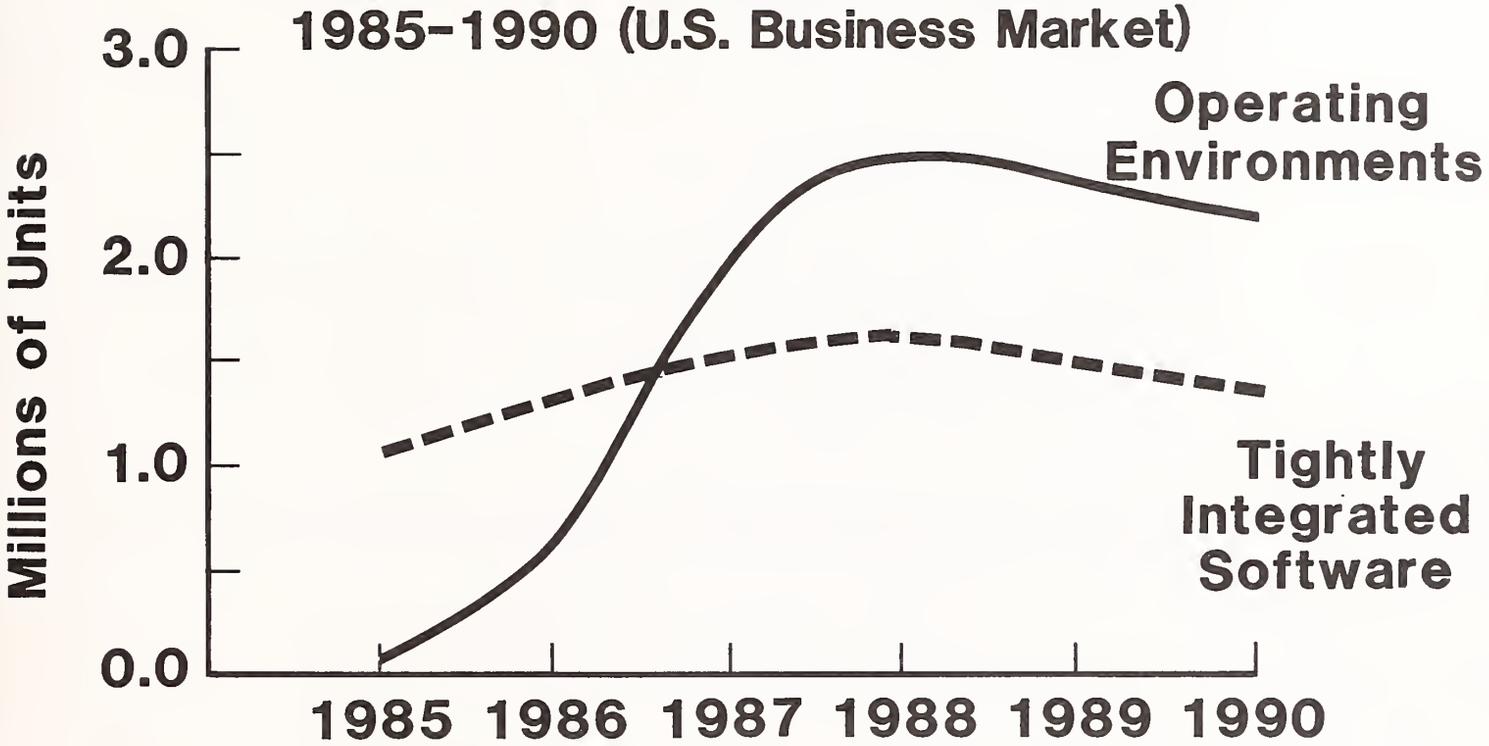
INTEGRATED SOFTWARE TO BECOME STANDARD BY 1990

Shipments of Integrated Software, 1985-1990 (U.S. Business Market)



C. TECHNOLOGY TRENDS IMPACTING INTEGRATED SOFTWARE

- Constant improvements in technology are the driving force in the integrated software market, leading to more powerful hardware at decreased cost (which will result in increased availability of computers), more sophisticated hardware (which will lead to better integrated software), microcomputers that are easier to use (which will help open up the market for integrated software to the vast group of new users), and a wave of new products, new markets, and new applications.

- The key technological advances impacting integrated software are:

  - More powerful processors, such as the Intel 80386 and Motorola 68020, will provide greater speed and better memory management. This greater processing power will be required by the larger, more robust packages that will emerge.

  - Artificial intelligence, although a number of years away from being commercially available, will make software:

    . Easier to use through natural language query systems.

    . Have added value with the addition of expert systems.

  - Multitasking, multiuser operating systems will allow the user to have more than one program or screen open at the same time. In addition, it will allow the development of multiuser versions for LANs.

  - Larger, higher-resolution monitors will make windows function better, and will provide better graphics capabilities that will improve the user interface.

  - Decreased storage costs, such as for hard disks, will make it easier for the user to deal with multiple programs.

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TECHNOLOGY TRENDS IMPACTING INTEGRATED SOFTWARE

- More Powerful Processors
- Artificial Intelligence
- Multitasking, Multiuser Operating Systems
- Larger, Higher-Resolution Monitors
- Decreased Storage Costs

D. CONNECTIVITY IS VITAL

- The key improvements that need to be made in integrated software relate to connectivity, flexibility, and extendability.

- Many current packages attempt to limit and define the functions and approaches available to a computer user. No one vendor can define a program that meets the needs of every user. It is vital that new programs provide a flexible framework, as shown in Exhibit II-4. Users desire the flexibility to:

  - Select which programs to use.

  - Determine how to do something.

- These goals can be met by packages that:

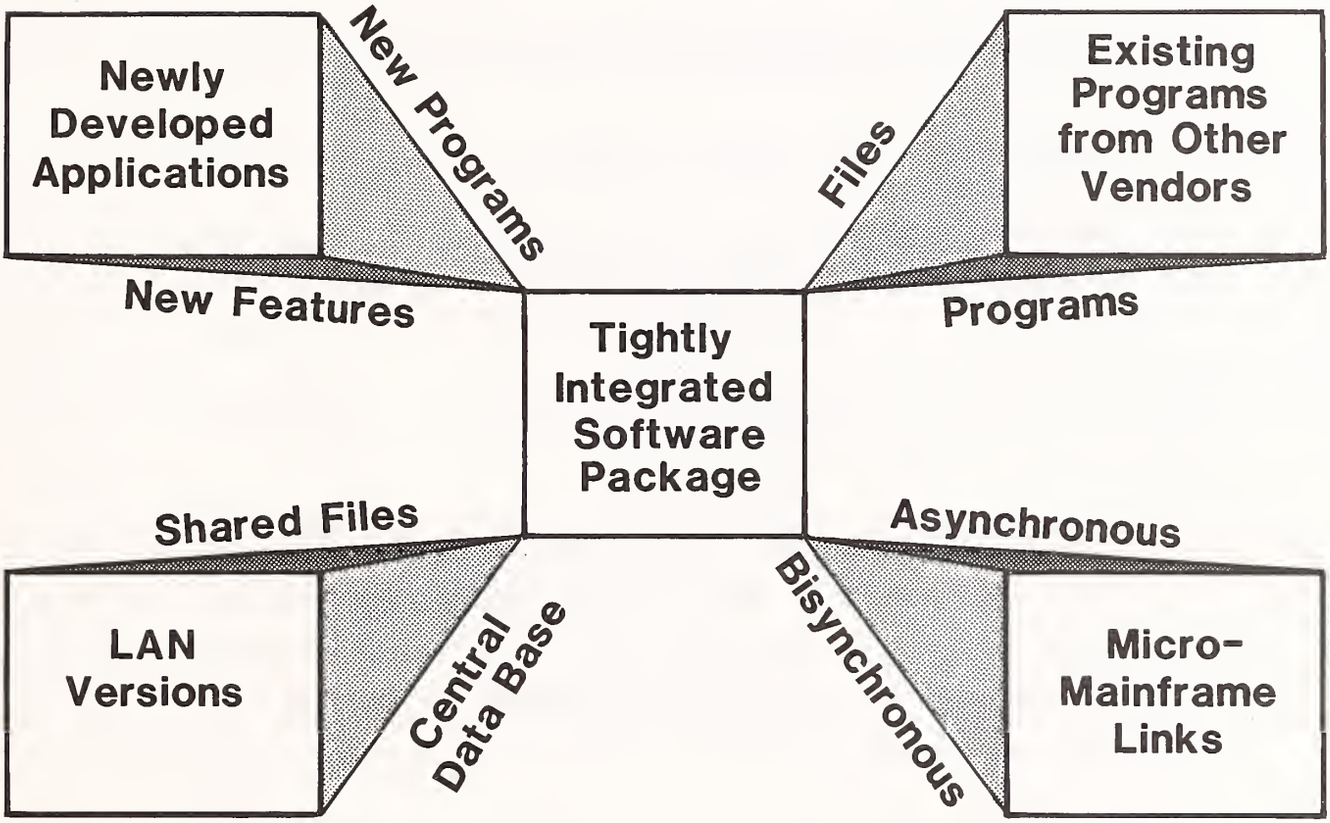
  - Incorporate new programs or new functions into the existing program. Integrated software packages must continually evolve to reflect rapid advances in standalone programs.

  - Are easily connected to existing files or programs from leading vendors, such as Lotus 1-2-3. As much as some users value integration, they also would like to continue to use their favorite programs.

  - Are able to share files and programs over a local area network.

  - Are easily linked to mainframes in order to provide access to centralized data bases.

CONNECTIVITY IS VITAL



E. RECOMMENDATIONS

- The new generation of integrated software offers many opportunities. Since no one package can satisfy the needs of all users, it is possible to compete against the market leaders, but markets must be chosen carefully. To be successful, new vendors must provide connectivity, flexibility, ease of use plus power (a new user interface is necessary if computers are to penetrate the market of untrained computer users, but adequate functionality must be retained), and anticipate marketplace shifts due to technology advances.

- The technology advances shown in Exhibit II-3 will create these opportunities. Additional opportunitues are also available. The generic productivity tool marketplace will be dominated by the large, established vendors; therefore, new vendors should concentrate on developing "activity oriented" software that focuses on the needs of a certain task, or on add-in programs for specific vertical markets.

  - Packages that revolve around a DBMS. Current products that use a DBMS as the core suffer from a lack of processing power. New hardware will open up the market for DBMS-oriented integrated software. A DBMS-oriented product offers advantages because other programs can be easily integrated with a data base manager.

  - Visually oriented software for the PC/AT. The new wave of Macintosh software that features an easy to use graphics-oriented interface (such as Jazz from Lotus) will create a user demand for similar features on competing products. A graphics-enhanced PC/AT will provide the necessary power for this type of product.

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RECOMMENDATIONS

- Provide Connectivity and Flexibility
- Provide Ease-of-Use plus Power
- Anticipate Marketplace Shifts Due to Technology Advances
- Target Vertical Markets
- Develop Packages That Revolve around a DBMS
- Develop Visually Oriented Software for PC/AT

III MARKET ANALYSIS AND FORECAST

A. CURRENT STATE OF THE MARKET

- The current market is fragmented and overcrowded, and the barriers to entry are increasing. There are indications that the first generation of integrated software is a bust. The future, however, holds great promise for those vendors that can develop the next generation of software.

- The integrated software market was born in 1982 with the debut of Context Management Systems Inc.'s Context MBA. This was followed by an announcement from Lotus, who in January of 1983 introduced Lotus 1-2-3, which rapidly became the best selling integrated software package. By the end of 1984, Lotus 1-2-3 had reached an installed base of over a half million. Lotus is now trying to duplicate that success with Symphony. It appeared that Lotus would continue to dominate this market when they announced the release of Symphony.

- Many competitors have since emerged. The summer and fall of 1984 produced a slew of new packages. Lotus' Symphony and Ashton-Tate's Framework were introduced in July with considerable fanfare. These two packages have also drawn the most media and market attention. However, they each have not met with the acceptance that their developers had hoped.

- Among the new entrants in this market, there is no clear winner, although Symphony and Framework have the early lead. Lotus 1-2-3 continues to do phenomenally well, in the face of all the competition. It is still the leading seller for integrated software. However, the first "truly" integrated packages shipped were Symphony and Framework.

- What does this portend for the integrated software marketplace? Was integration merely a fad, to be replaced by the next hot product? On the contrary--the integrated market will continue to grow and prosper, if developers can make the necessary adjustments.

- For integrated software, it is likely that no "standard" will appear, as 1-2-3 did for spreadsheets. Individual taste will support a wide variety of integrated software.

- The perception of today's customers is one of confusion followed by disappointment. With all of the hype contained in the press, customers are wary, and rightfully so. They expect the package to be easier to use, to be more powerful, and to have fewer internal memory requirements.

  - Many people aren't willing yet to invest the time to learn and re-input data into a new system.

  - Many computer users may prefer to wait and upgrade their hardware, while hanging on to their current software, before adopting integrated software.

  - But the customer base is gradually accepting the trend toward integration.

- In the meantime, many are comfortable with their standalone packages. Software firms are promising more programs, more power, and more interfacing among files. But the reaction from customers appears to indicate that

more is not necessarily better. Integrating five business programs into one package may sound like an ideal concept, but many users say they find quality, functionality and ease of use sometimes sacrificed for quantity.

- Customers seem to value familiarity over features; that is, if they can stick with the packages they are already using, they will be satisfied. A product that does one thing well is better received than one that does several things in mediocre fashion.

B. OVERALL MARKET FORECASTS

1. FORECAST OF TIGHTLY INTEGRATED SOFTWARE

- The projected shipments and user expenditures for tightly integrated software are shown in Exhibits III-1 and III-2. The forecast is for cross-industry applications only.

  - Shipments will grow from 770,000 units in 1984 to a peak of 1.6 million units in 1988, and then gradually decline to reflect declining hardware shipment rates.

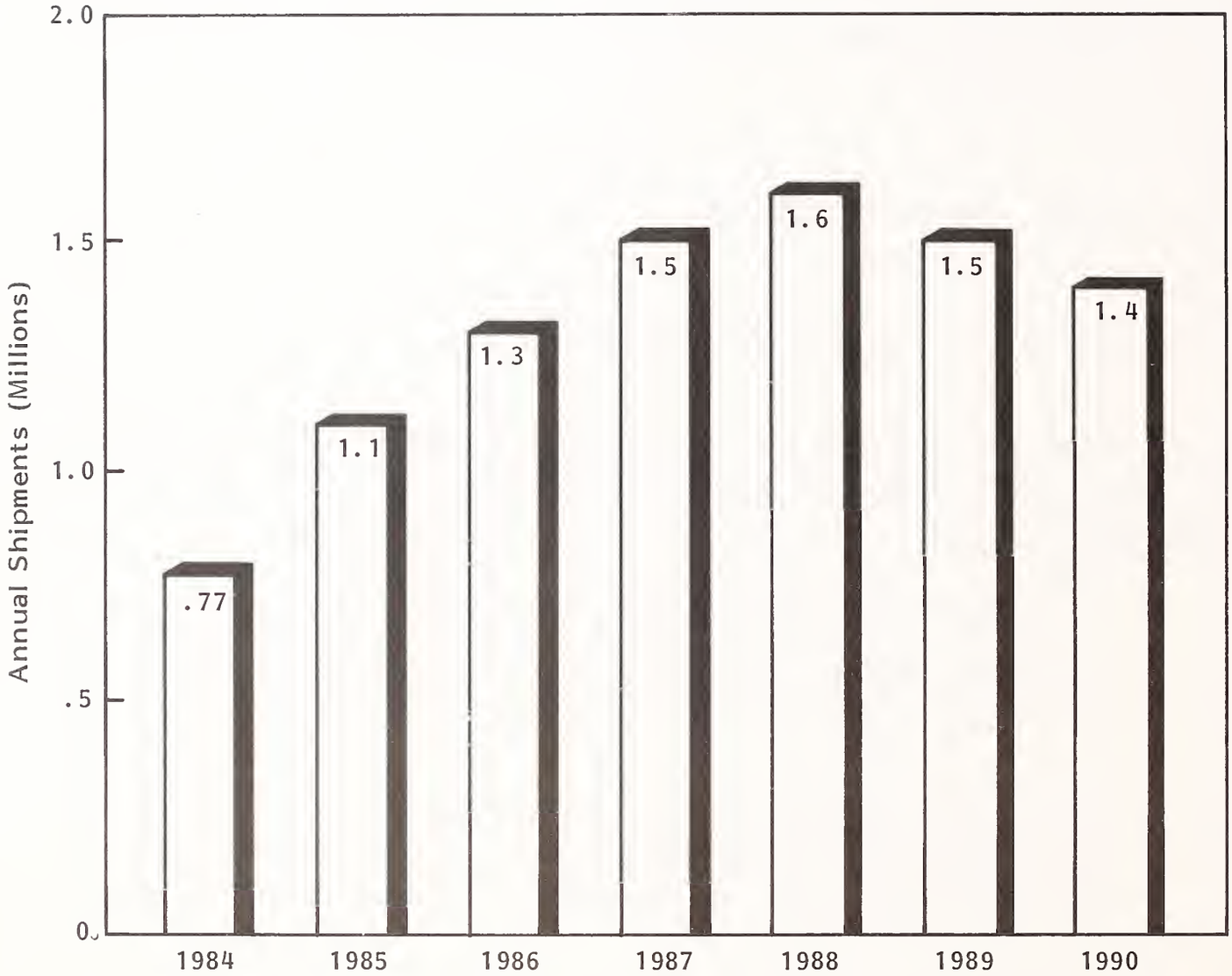
- User expenditures will show a much flatter growth curve, however, due to the falling average price of integrated software. The price of an all-in-one package will decline from an average of $525 in 1984 to an average of $225 by 1990.

- The key factors changing in the market are:

  - Integrated software is becoming easier to use and more powerful.

EXHIBIT III-1

UNIT SHIPMENTS OF TIGHTLY INTEGRATED SOFTWARE, 1984-1989
(U.S. Business Use)



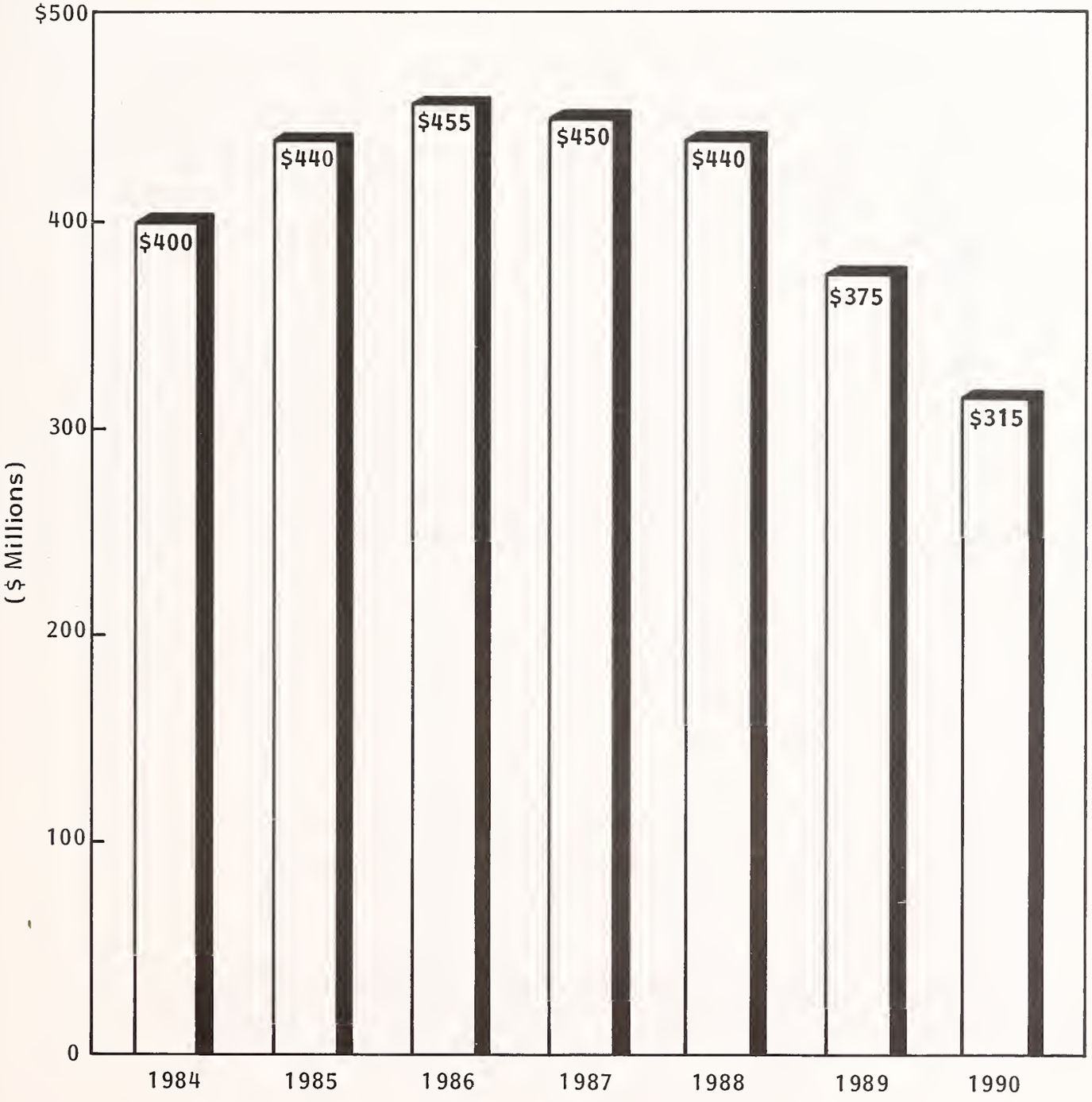
Types of Packages Included:

Counts all-in-one packages (3 or more applications), tightly integrated product families.

Excludes loosely integrated product families; operating environments.

EXHIBIT III-2

USER EXPENDITURES FOR INTEGRATED SOFTWARE, 1984-1990
(U.S. Business Use)



- The nature of the installed base of microcomputers will change. More powerful hardware, such as the PC AT and PC II, will be in place. Integrated software and environments require this additional power in order to run effectively.

2. FORECAST OF OPERATING ENVIRONMENTS

- For operating environments, growth will be dramatic. It starts out slowly, but eventually, as operating environments are included with all hardware sold, the shipment rate will skyrocket. The growth can be seen in Exhibit III-3. The market for operating environments grows from an installed base of 20,000 in 1984 to 2.2 million units shipped in 1990. This represents on average annual growth rate of 119%.

- A revenue forecast was not made for the operating environments because most of the future sales will not be in the form of separate packages; rather, operating environments are likely to be either bundled with the hardware, built into the hardware, or to have become a standard part of most operating systems. Hence, there is a limited market for sales to end users of this type of product.

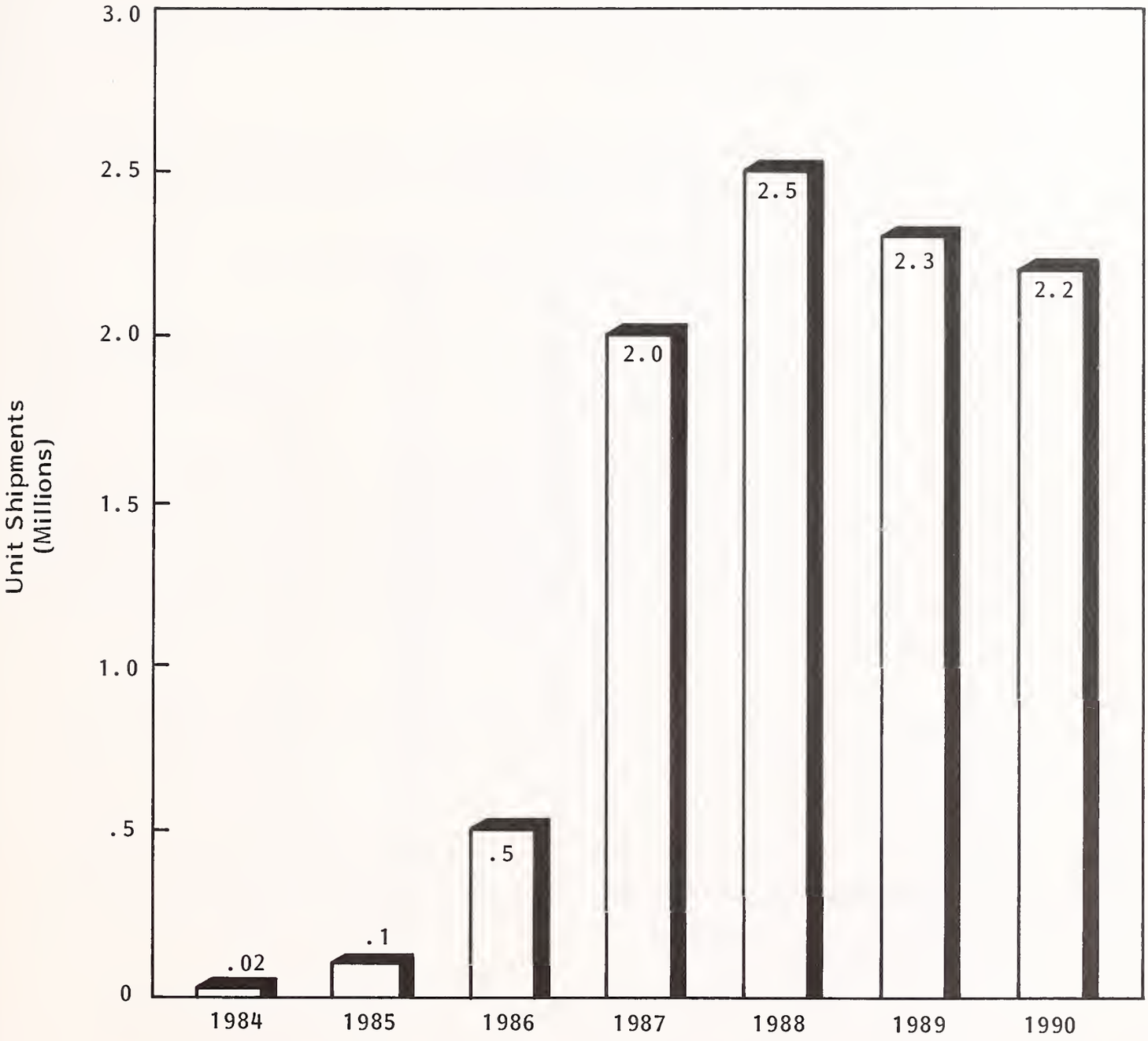
- Within two years, IBM will have straightened out the problems with Topview, and software vendors will have had time to adapt their programs to make them "Topview-compatible."

- There will only be room for one standard, although many may follow that standard. The standard will be "Topview-compatible," because IBM is in a strong position to set a de facto standard.

- The average selling price should drop from approximately $150 today to $50 by 1990.

EXHIBIT III-3

OPERATING ENVIRONMENT UNIT SHIPMENTS, 1984-1990
(U.S. Business Use)



- The price decline will be the result of vendors such as IBM placing the operating environment in ROM or with the operating system.

- Purchasers of IBM and IBM-compatible machines will receive it automatically in a few years, just as they get PC-DOS or MS-DOS today.

- But just because a user has an operating environment doesn't exclude the use of an all-in-one integrated package.

  - Many will use the operating environment, not for its integration capabilities, but for its user-friendly interface with the operating system.

3. ANNUAL SHIPMENTS OF PERSONAL COMPUTER HARDWARE

- The microcomputer hardware forecasts upon which the software forecasts are based are shown in Exhibits III-4 and III-5.

- The average configuration will change for hardware. The price/performance levels will continue to improve. More powerful processors, combined with greater and cheaper memory and storage, will lead to larger quantities of more powerful hardware being sold, which will increase the demand for integrated software.

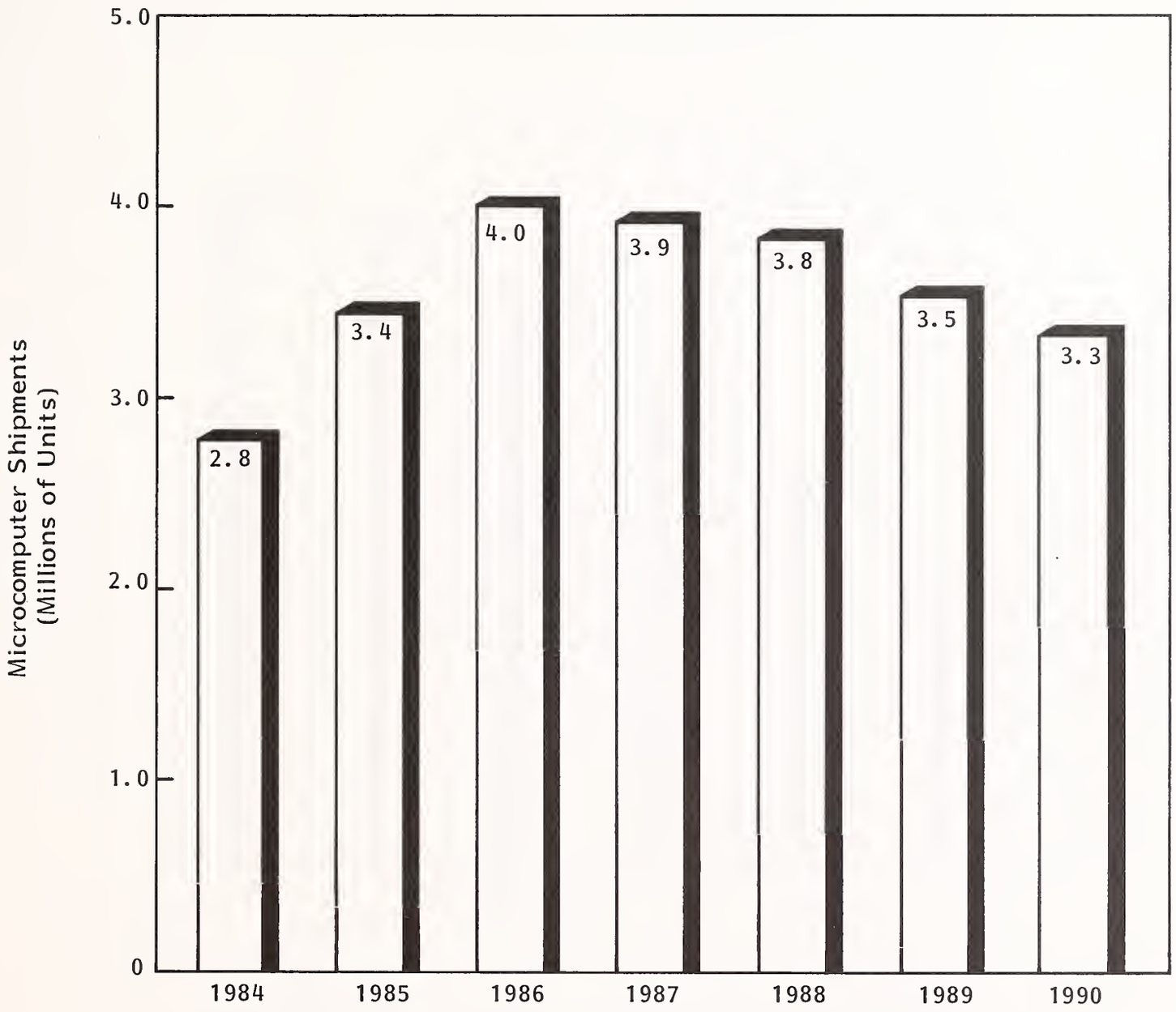
- Exhibit III-6 shows the dramatic growth expected for multiuser systems and LAN-connected microcomputers.

- Exhibit III-7 contains a breakdown of U.S. white collar workers by type of job. Current penetration and future potential penetration rates of microcomputer usage are also included.

- Assumptions made for the tightly integrated software forecasts are listed in Exhibit III-8.

EXHIBIT III-4

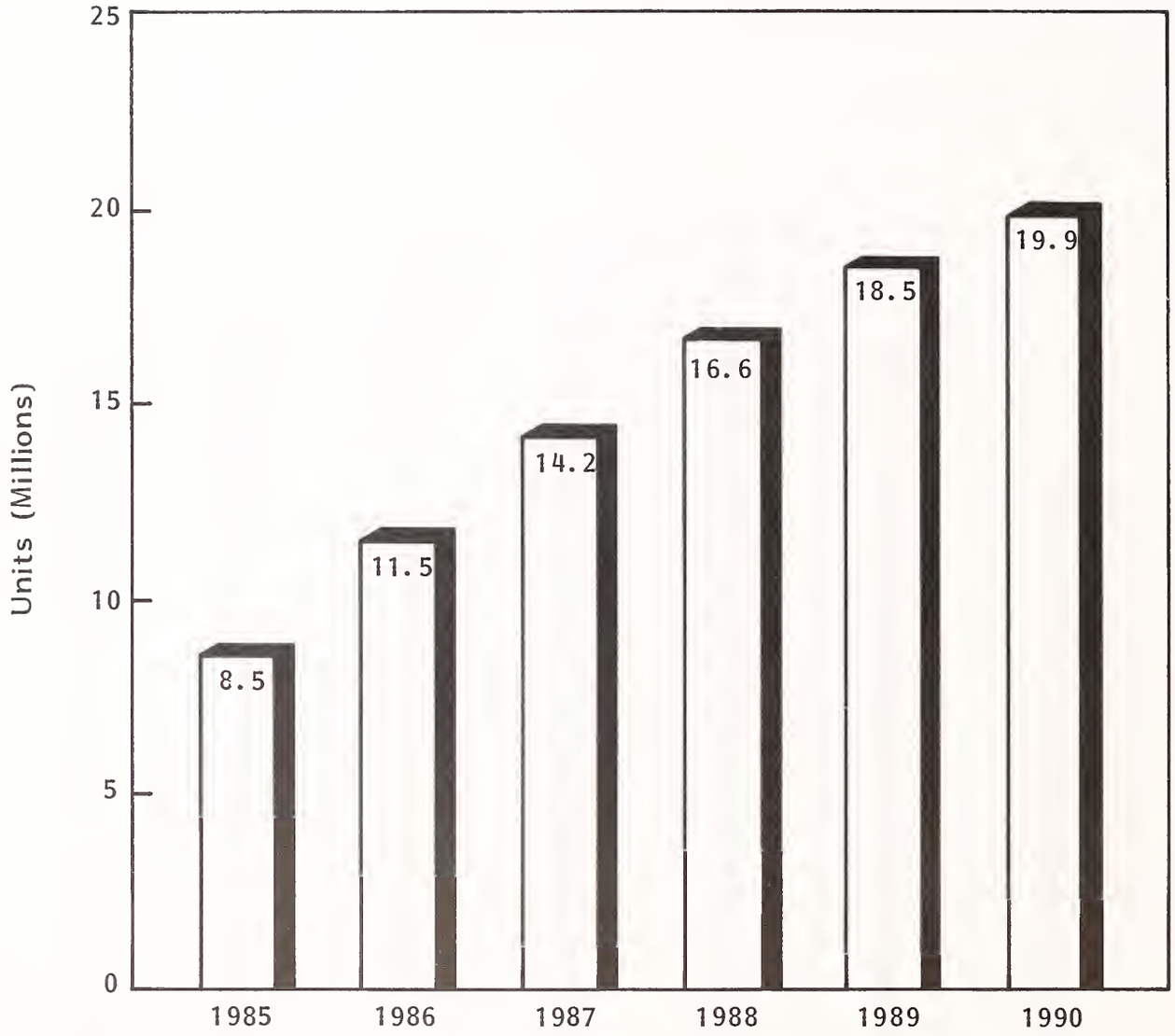
ANNUAL SHIPMENTS OF MICROCOMPUTERS*, 1984-1990



*U.S. sales of microcomputers selling for less than $15,000 that are used for business.

EXHIBIT III-5

NET INSTALLED BASE OF MICROCOMPUTERS*, 1985-1990



*U.S. sales of microcomputers selling for less than $15,000 that are used for business.

EXHIBIT III-6

CONNECTIVITY GROWTH, MICROCOMPUTER INSTALLED BASE
(U.S. Business Market)

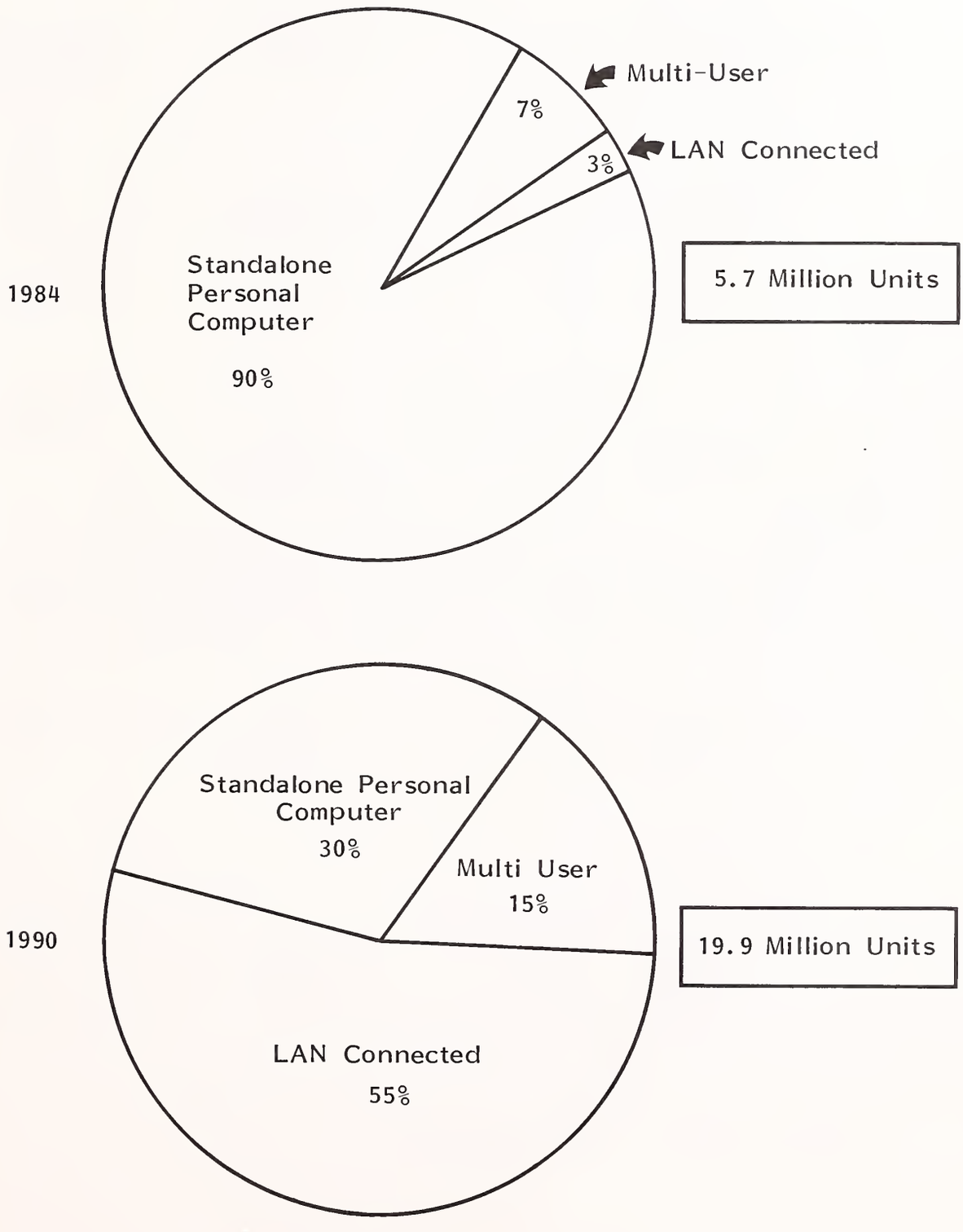
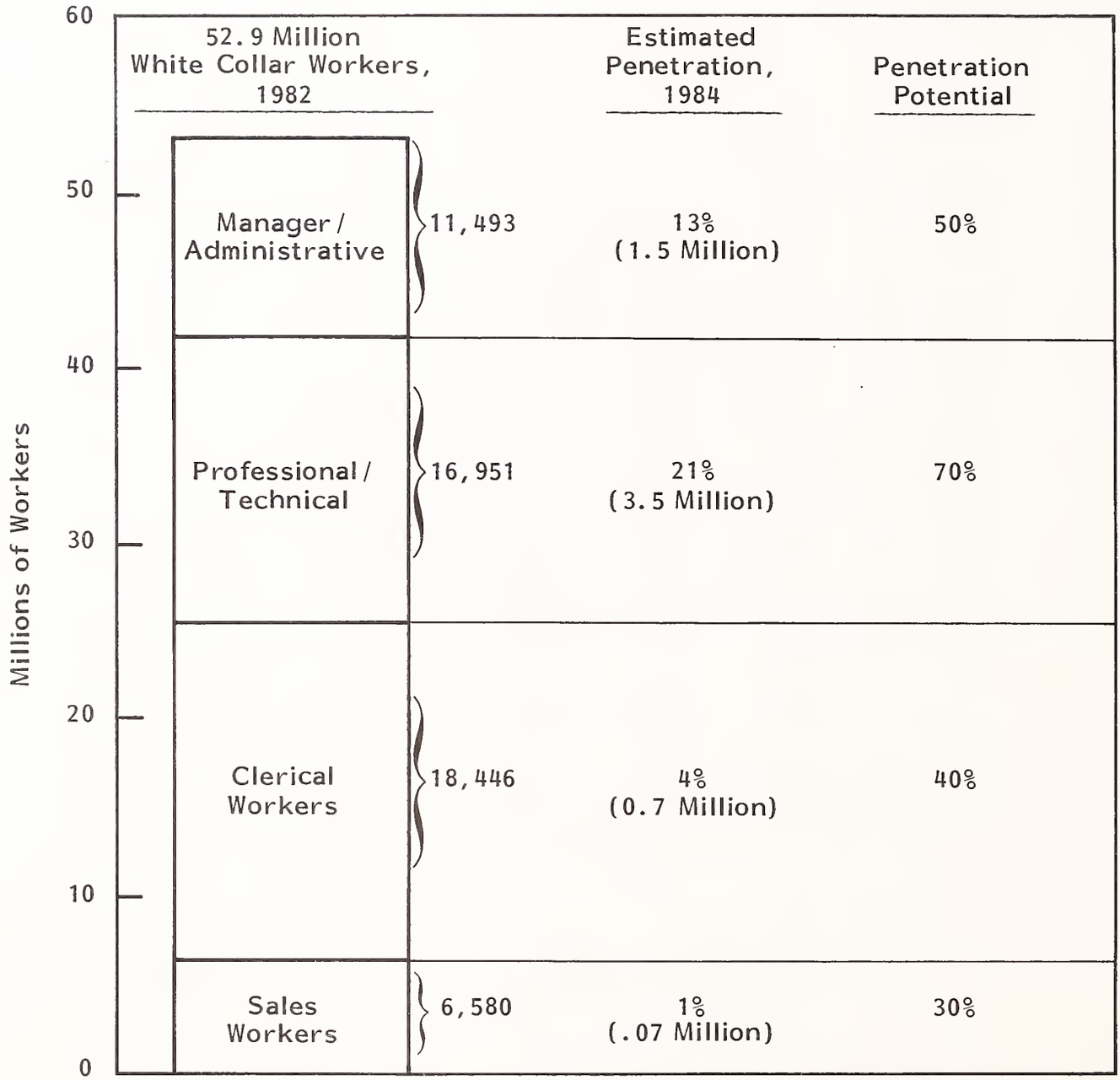


EXHIBIT III-7

MICROCOMPUTER PENETRATION OF U.S. WHITE COLLAR WORKFORCE



Total PCs Installed, 1984: 5.7 Million

Source: U.S. Bureau of Labor Statistics, 1984.

EXHIBIT III-8

ASSUMPTIONS MADE FOR TIGHTLY INTEGRATED SOFTWARE FORECASTS

- The forecast is for end user expenditures, not vendor revenues. A typical breakdown of the end user purchase price would be as follows: 40% - 20% - 40%. That is, the software vendor receives 40%, the distributor receives 20%, and the retailer receives 40%. These percentages would be adjusted if the vendor bypasses the distributor or sells directly to corporations.

- The forecast assumes a 6% per year inflation rate for 1984 to 1990.

- To be included in the integrated software forecast, the package must be tightly integrated. Examples of packages that are included are: Symphony, Framework, Smart Series, and Lotus 1-2-3. Examples of packages that are not included are: Peachtext 5000, Pfs: Series, and IBM's Assistant Series.

- Assumptions made for the operating environment forecasts are listed in Exhibit III-9.

- Assumptions made for the microcomputer hardware forecasts are listed in Exhibit III-10.

EXHIBIT III-9

ASSUMPTIONS MADE FOR OPERATING ENVIRONMENT FORECASTS

- To be included, the operating system must be available for purchase, either as a separate product or as part of the operating system. Hence, the Macintosh as an integrating system is not counted (although products sold for the Mac are); but products like Topview, even if they are bundled with the hardware, are counted.

EXHIBIT III-10

ASSUMPTIONS MADE FOR MICROCOMPUTER HARDWARE FORECASTS

- The forecast is for U.S. sales only.
- The forecast includes computers bought for business use; computers bought for home and classroom use are excluded. However, computers used for administrative purposes in educational institutions are included.
- A computer must be used at least half the time for business purposes to be included as a business computer.
- The definition of the computers counted in the forecast is as follows:
  - Price range: Less than $15,000 in current dollars for a complete system, including monitor, memory, and storage.
  - Minimum configuration: 8-bit CPU, 64K RAM, monitor, and one floppy disk drive, (Unless it is a portable).
  - The forecast counts only those machines that can serve as stand-alone computers and are sold for general purpose use. Consequently, the following products are not included:
    - Dedicated word processors, graphics workstations, dedicated CAD/CAM systems, terminals, and intelligent terminals with memory but no CPU.
- Machines that are included are: Personal computers, multiuser computers, intelligent workstations,and executive workstations.
  - Multiuser systems sold for less than $15,000 are included; however, only the CPU is counted; the terminals are not.
  - A personal computer connected to a host or to a network is counted. But, the computer must have some form of local storage.
  - Workstations, to be counted, must be able to function on a stand-alone basis.
  - For the installed base forecast, a retirement rate of 12% for 1985 and 1986, and 10% per year for 1987 through 1990 was assumed.
  - Portables, luggables, and laptop computers are included.

IV PRODUCT ANALYSIS AND TRENDS

A. PRODUCT ANALYSIS: INTEGRATED SOFTWARE

1. ADVANTAGES AND DISADVANTAGES OF INTEGRATED SOFTWARE

- The philosophy behind integrated packages is that the whole is more than the sum of the parts. That is, the overall functionality of the package exceeds the total functionality of the separate parts.

- The intention of integrated software is to mimic the typical office environment, in which workers shift from one task to another whenever necessary, regardless of the nature of the tasks. The programs are intended to make the movement from one application to another more natural and to minimize interruptions.

- The advantages and disadvantages of tightly integrated software, both present and future, are summarized in Exhibit IV-1.

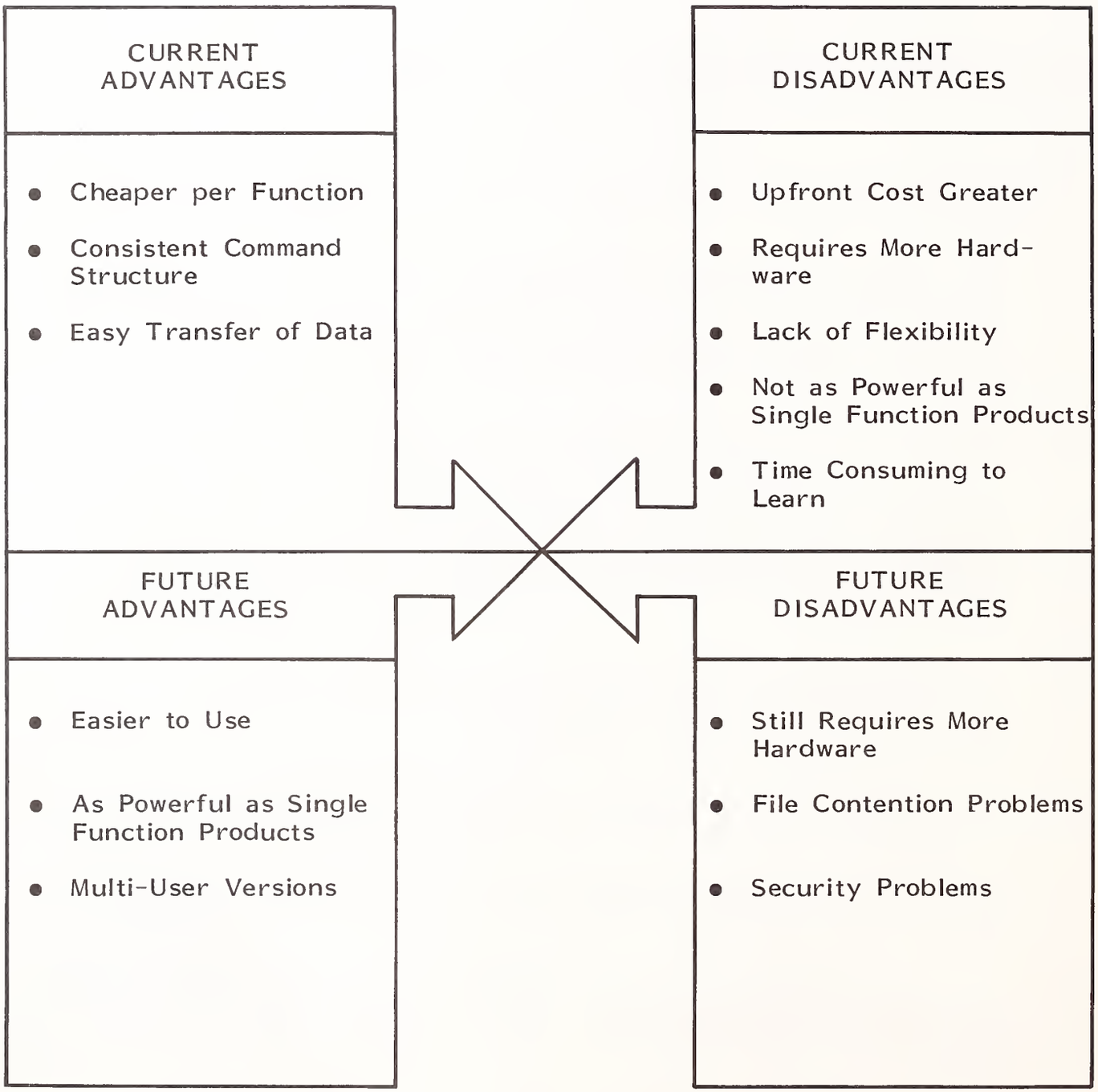
- The advantages of today's tightly integrated software are as follows:

  - Cost per function is cheaper if a user uses two or more functions.

  - Training costs are lower for learning one integrated package than for a series of separate packages.

EXHIBIT IV-1

TIGHTLY INTEGRATED SOFTWARE ON BALANCE



- Provides compatible data structures and fast context switching; that is, the ability to move instantly and effortlessly from one program to another and bring the data you were working with along with you.

- Since most business documents use a combination of text, numbers and graphics, an integrated package facilitates in combining this information.

- In the future, integrated software packages will have additional advantages:

  - As successive generations are developed, the user interface will be refined so that the programs will be much easier to use.

  - In addition, integrated products can be developed that offer all of the power of the leading standalone programs, while providing the additional power that integration provides. An example of this type of package is Enable, from The Software Group.

  - Multiuser versions will be developed that permit shared files. This should provide a boost to office productivity.

- The drawbacks to today's generation of integrated software include the following:

  - Few people need or use all of the functions.

  - Cost per function is greater if you use only one of the functions.

  - Integrated software is more difficult to use than a single standalone package.

  - The power of individual functions may be sacrificed.

- Cost of hardware is greater: most all recommend or require 512K RAM and a hard disk.

- Current integrated software packages restrict a user's flexibility, because the programs try to define an entire software world for the user.

- Five functions crammed into one program can be difficult to learn and use because of the numerous commands, interconnections, and menus.

- They can be too slow, although the speed should improve on 80286-based computers like the PC AT.

- In the future, most of the disadvantages of integrated software will be overcome. One problem area that will remain is with multiuser versions. Multiuser systems have inherent problems with file contention and file security.

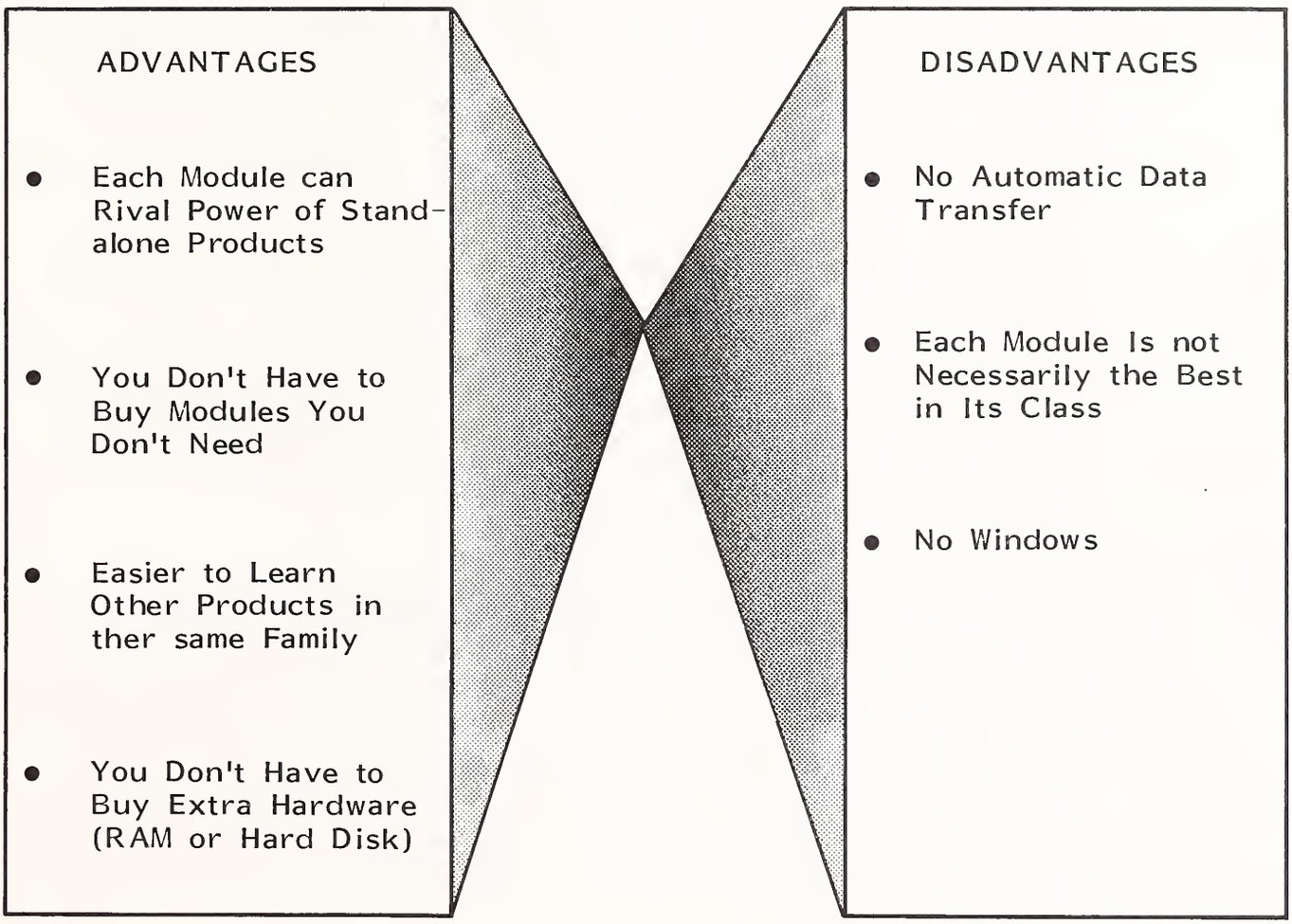
- The advantages of loosely integrated software are shown in Exhibit IV-2.

  - The primary advantage of a loosely integrated series is that small businesses and professionals can choose the functions they need to improve administrative operations one step at a time. Thus, the cost of the software is spread out, rather than being one large lump sum, as with an all-in-one package.

  - The primary disadvantage is that on the current generation of hardware the programs do not load or run simultaneously. Thus, the data exchange procedure is more cumbersome than with tightly integrated packages. Also, a user must still move in and out of different programs in order to perform all the different functions.

EXHIBIT IV-2

LOOSELY INTEGRATED SOFTWARE ON BALANCE



- However, the recently introduced operating environments will make using loosely integrated software more convenient, because a user can load and run applications concurrently.

- Many of the new integrated software programs require additional memory, and almost all require a hard disk to take advantage of the integration they offer.

- A major drawback to operating a package such as Symphony is its minimum memory requirement of 512K RAM, a factor that translates into a significant financial commitment in terms of upgrading costs. The associated costs for upgrading to several types of programs are shown in Exhibit IV-3.

  - Since most personal computers have only 256K, the costs involved with upgrading systems in a company that owns hundreds of personal computers would be prohibitively high. For example, the cost of upgrading a system to Symphony for 100 users would be approximately $440,000. This upgrade cost is an expensive proposition and will serve to hinder the market.

  - Because of these costs, it would appear that programs that require less memory and can run well without a hard disk, such as Enable, would have an advantage. While this is true today, it may be a short-lived advantage, since in the future, the installed base of microcomputers will consist of a greater number of high-performance machines (such as the PC AT) that will be able to take advantage of integrated software without an upgrade.

2. FUNCTIONS THAT HAVE BEEN INTEGRATED

- The functions that have been integrated are the five leading generic productivity functions (word processing, data base management system, graphics, spreadsheet, and telecommunications). These functions will continue to be at

EXHIBIT IV-3

COST OF INTEGRATED SOFTWARE UPGRADES

Cost of Upgrading from 1-2-3 to Symphony

• From 256K RAM to 640K RAM:	$ 400
• From 2 Disk Drives to a Hard Disk	$1,800
• Software Upgrades	$ 200
• Training and Support	$2,000
Total	$4,400

Cost of Upgrading from 1-2-3 to Enable:

• Software	$ 695
• Training and Support	$1,000
Total	$1,695

Cost of Upgrading System to be able to Run Topview:

• From 256K RAM to 640K RAM	$ 400
• From 2 Disk Drives to a Hard Disk	$1,800
• Software	$ 149
• Training and Support	$ 500
Total	$2,849

Assumptions:

- Assumes user already has applications software.
- 640K is highly recommended to run Topview and Symphony.
- Prices are average selling prices rather than minimum prices.
- Assumes user starts with Lotus 1-2-3, 256K RAM, and 2 disk drives.

the core of an integrated system. However, some vendors have added to this list, and have added other generic productivity tools, such as project management, spelling checkers, outline processors, etc.

- Truly integrated software will let you link anything to anything else in all directions. But linking in many packages is limited--permitted only between a spreadsheet and a graph, for example. Even packages that link all tasks generally do so only in one direction: you can put a spreadsheet cell in a word processing document, but you cannot change the spreadsheet values while using the word processor.

- Presently, integrated packages stem from, or emphasize one function, such as a spreadsheet or a word processor. Examples are shown in Exhibit IV-4.

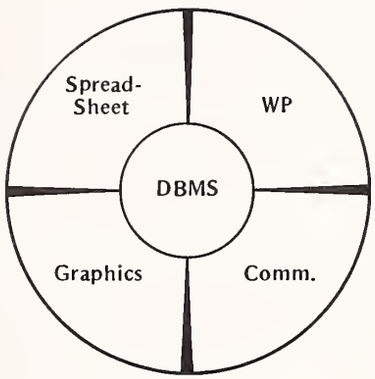
- Currently, there are very few successful data base-oriented integrated packages for micros owing to the lack of hardware able to take advantage of such a package's capabilities. But with a new generation of 80286-based machines on the horizon, most future integrated packages will have a data base orientation.

- The major advantage to using a relational data base as the integrating structure is that one can easily derive a spreadsheet or a graph from a data base. If all of a company's data is organized in one versatile data base, then it is easy for different users to manipulate the information--for example, for billing or for individual correspondence.

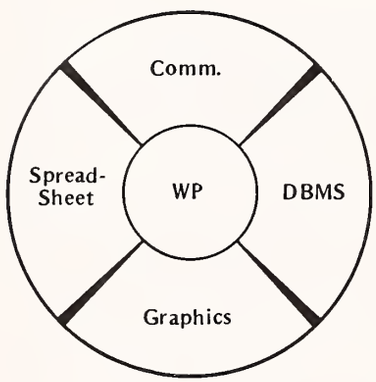
- While building a product on a common data base structure is definitely the wave of the future, the trend may be slow developing, because it is much more difficult and expensive to develop this type of product.

- This will parallel the development occurring in the mainframe software world, where applications are being integrated with data base management programs.

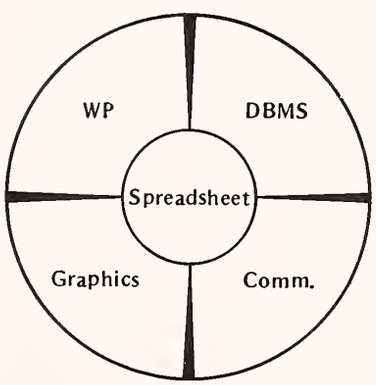
THE DIFFERENT FUNCTIONAL FOUNDATIONS FOR INTEGRATED SOFTWARE



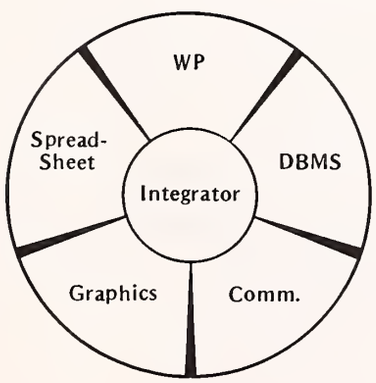
Products	Orientation
Aura Metafile Dayflo Knowledgeman	Heavy Information Management or Recordkeeping Needs



Framework Samna Plus	Writer, Manager; Office Environment



Symphony	Number Cruncher, Financial Analyst



Topview Windows Enable	Infrequent User, Person Who Has Existing Software

3. TRENDS

a. Functions That Will Be Integrated

- A portent of the direction that the next generation of integrated software will take are the new standalone products and programs that provide links between just two applications. Exhibit IV-5 provides examples of innovative links in software products that may be incorporated into a more comprehensive integrated package.

  - While they may currently only integrate two applications, that link will remain when other modules are added to the application.

  - Alternatively, the programs that integrate just two or three applications may be successful in their own right, and so no new modules will need to be added.

- Developers of successful integrated packages will stay in business long enough to add still more functions.

- Examples of functions that are likely to be integrated more frequently in the next generation of integrated software are shown in Exhibit IV-6.

- Accessory programs are being sold successfully that include a calendar, rolodex file, time manager, directory, calculator, scratch pad, clock, tickler file, etc. The more useful of these will most likely be incorporated into ROM or into the operating system.

- An "idea processor" will be developed and integrated into future packages. This would combine a thought processor with a free-form data base. A free-form data base is designed to handle text more easily than a traditional data base, where the text is required to fit into predefined fields. Text data bases such as Ideaware's Idea Processor, Dayflo Inc.'s Dayflo, and Forethought Corp.'s Factfinder let you store ideas in small, easily retrieved text files.

EXHIBIT IV-5

INNOVATIVE LINKS IN SOFTWARE PACKAGES

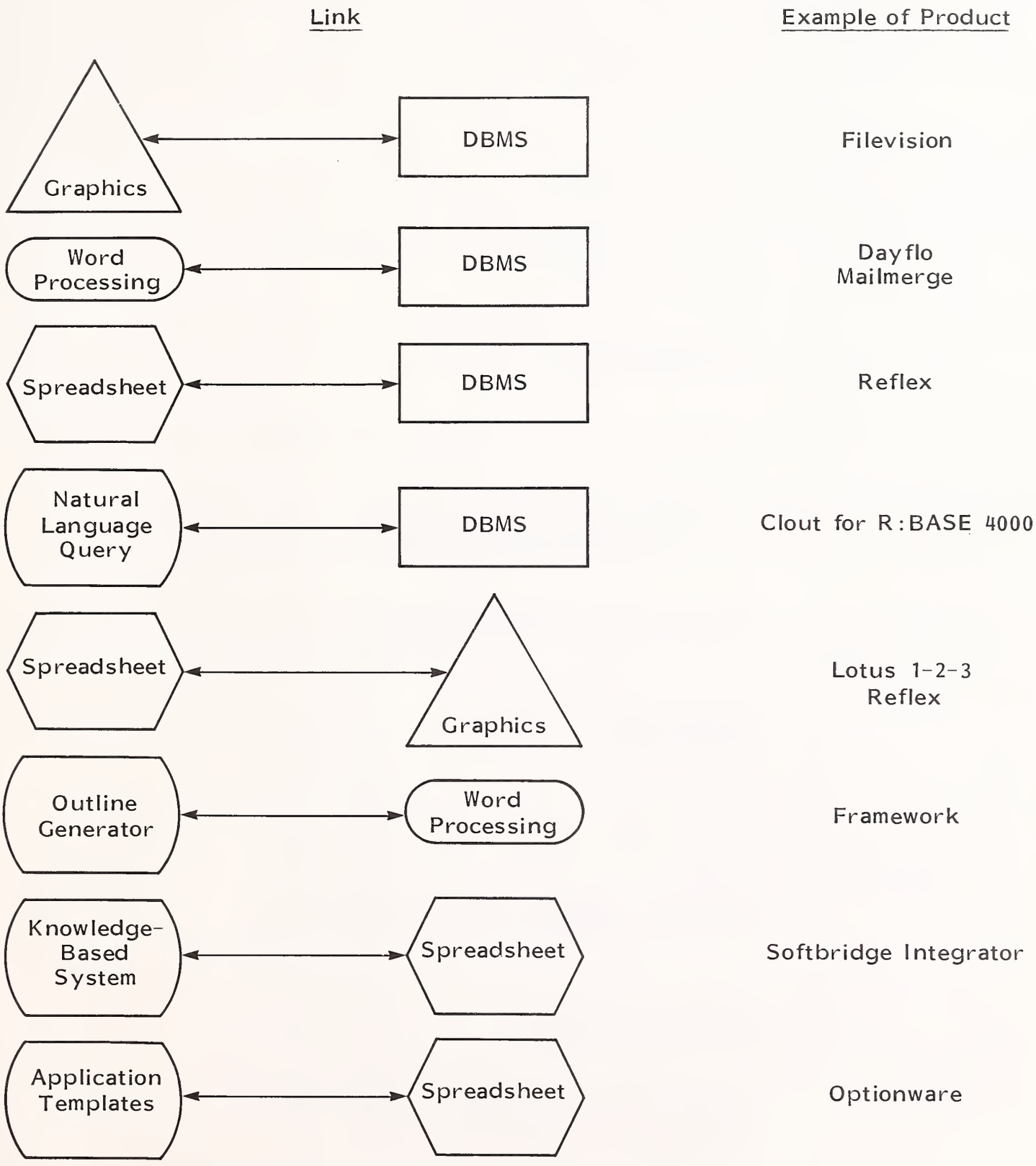


EXHIBIT IV-6

FUNCTIONS OR APPLICATIONS THAT WILL BE INTEGRATED MORE FREQUENTLY IN THE FUTURE

- Project Management
- Statistical Analysis
- Spelling Checker
- Style Checker
- Asynchronous Communications
- Bisynchronous Communications
- Calendar and Telephone Management
- Outline Generator
- Accessory Programs (Calculator, Notepad, etc.)
- Improved Graphics
- Vertical Market Templates

- Micro-mainframe communications will be added to integrated software. Digital Communications Associates released an emulation board for use with Symphony that downloads data from an IBM mainframe in Lotus 1-2-3 format.

- Vendors of an integrated package must be in a position to respond quickly to any significant advances in the leading standalone packages.

  - For example, when Lotus releases an updated version of 1-2-3, integrated software vendors should respond by incorporating the important new features into their product.

  - Consequently, integrated software will continually evolve to reflect improvements in new standalone programs.

b. Connectivity Trends

- Connectivity is the major trend for the 1980s in computing, and integrated packages will have to take this into account.

- Users want the benefits of integration, but they also want the flexibility to be able to use either files they have already created or their favorite programs.

  - With integrated products such as Enable, you can have state of the art programs, but you don't necessarily have to give up old files. A product like Enable allows users to incorporate files from many other vendors' programs into their own integrated program. By importing these files, users gain the added features of a standalone package without losing the advantages of data integration.

  - The next generation of integrated software will produce packages flexible enough to incorporate other programs, either by using their own command modules (as in Enable) or by using something like Topview so that the programs can coexist.

- The Smart series has an open-ended design that lets users transfer data from other vendors' programs or develop their own custom programs.

- Future products will be open-ended; that is, users can add virtually any other PC-DOS application to the menu, as with Topview or Desq, and can invoke that application from within the shell. This method is depicted in Exhibit IV-7.

- The advantage to having a central integrator provided by an integrated package such as Enable is that it

  - Can load all applications simultaneously, because of the reduced memory requirements due to the elimination of redundancy between programs.

  - Provides data interchange capabilities among other programs.

- Some companies offer extendable systems, which are open to third-party vendors who can add still more functions that will work in the same way as the original package.

  - Symphony has a set of add-in tools that provide links to outside programs, making these programs work as part of Symphony.

  - Before long, sophisticated applications will be written to run within Framework, Symphony, or their successors.

- Programs need to be flexible, because no one company can define a program that meets the needs of every user. Thus, integrated software vendors must provide a flexible framework for their programs. As shown in Exhibit IV-8, integrated software packages should provide for the following connections:

EXHIBIT IV-7

FLEXIBILITY VERSUS TIGHT LINKAGE TRADEOFF

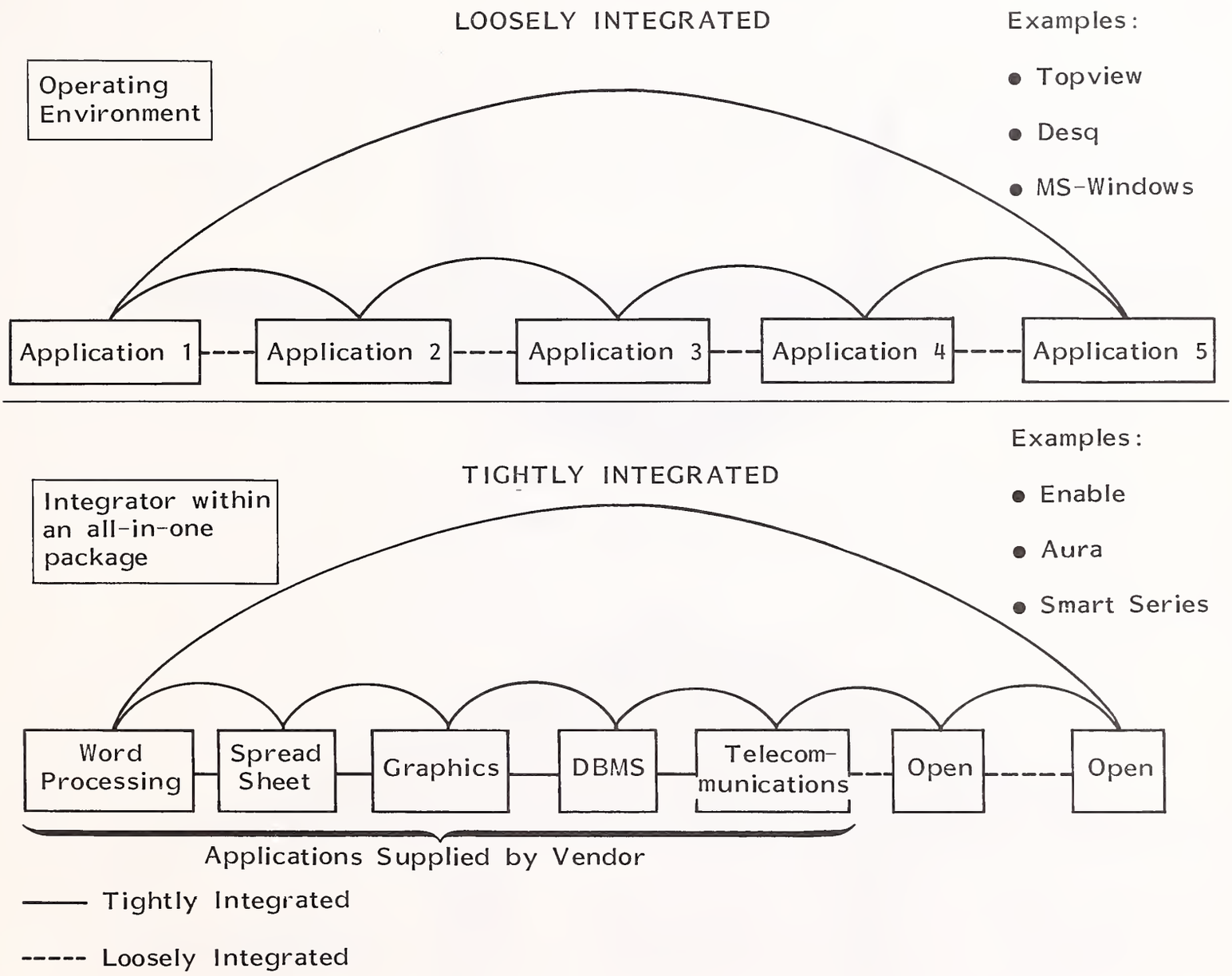
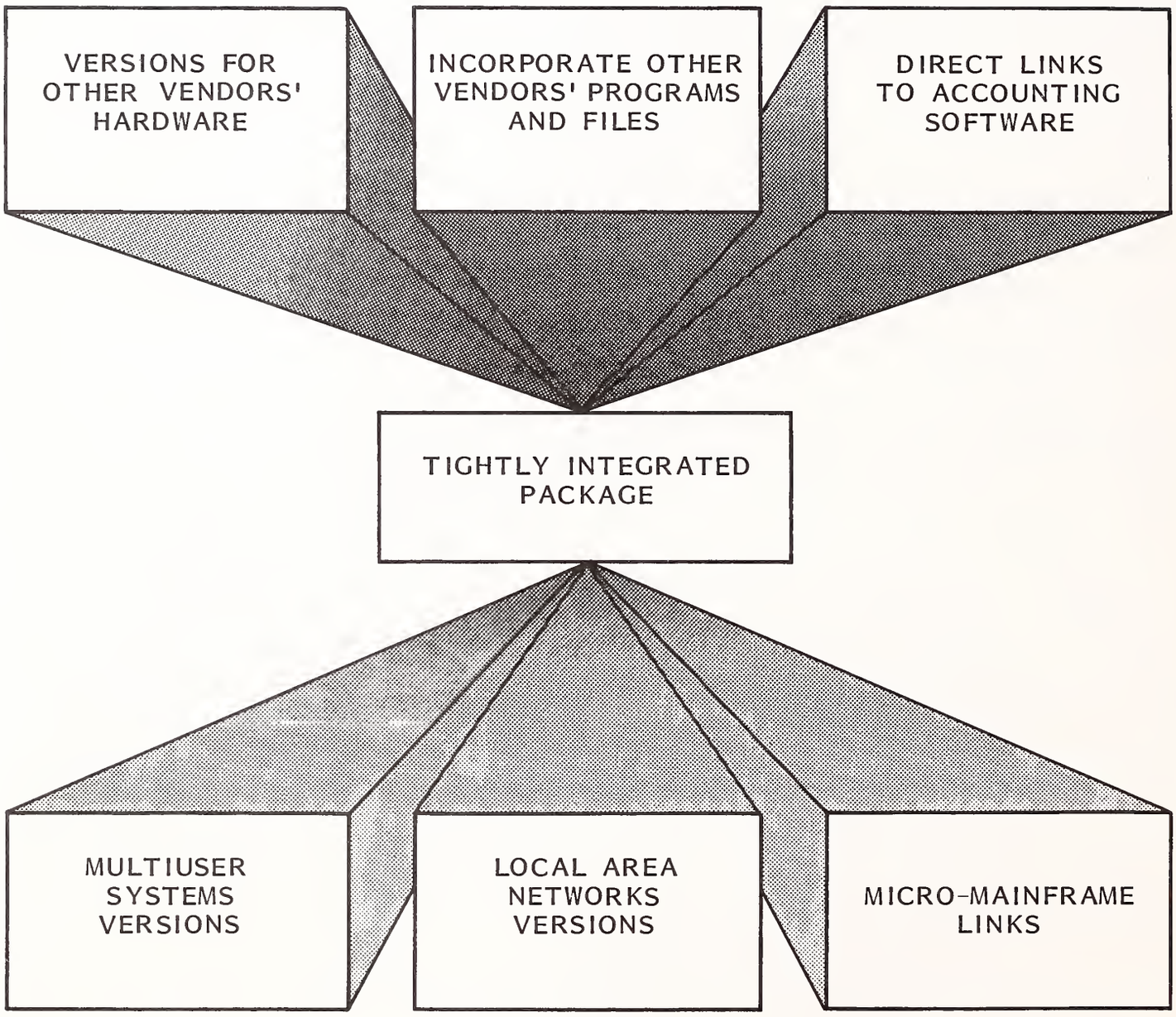


EXHIBIT IV-8

BE FLEXIBLE: OFFER CONNECTIVITY



- Integrated with newly developed applications.

- Easily connected to leading existing programs from other vendors.

- Links to accounting packages.

- Shared files through multiuser and LAN versions.

- Access to centralized data bases via micro-mainframe links.

- Smaller vendors will lack the resources to establish this level of connectivity. One solution for these vendors is to form cooperative arrangements with other vendors that provide the other end of the link.

- Accounting and integrated software will be merged in packages targeted to small businesses. Since accounting operations are the heart and soul of a small business, this will be a valuable feature for that market.

  - BPI Systems, a leading vendor of accounting packages, acquired Softrend, which developed the Aura integrated package. They are integrating the two packages by offering a link that allows data from BPI accounting products to be reformatted for use in Aura. It also permits the importation into Aura of data from 1-2-3, dBase II, Wordstar, or any ASCII file. They want to take advantage of the apparent synergy produced by integrating accounting software and productivity software.

  - IBM recently entered the accounting plus productivity software market with its new Business Management Series (accounting software) and Personal Decision Series (integrated productivity software), underscoring that the two sets of software could share and exchange data.

- Peachtree also links their accounting packages with their integrated software products.

- It will become increasingly important for vendors to support generally accepted data formats. Today the situation is like a Tower of Babel, where the user has to deal with different operating systems, different file formats, and different command structures. Customers, through their purchasing actions, are forcing standardization and integration. Successful products must be able to import data files easily.

- Currently, if you need to exchange information among different integrated packages, your only choice is to move "dead" information via an intermediate memory buffer or ASCII disk file.

  - Pure ASCII files contain only text and numbers; you must almost always reformat the file before doing anything with it.

  - SYLK, originally developed by Microsoft for Multiplan, is the only common interprogram file format that preserves not only current values but also formulas and relationships.

- New products will allow easy data transfer from other programs, especially Lotus 1-2-3. Since Lotus has an installed base of over a half million users, a larger number of people have files set up in Lotus. Consequently, it is important in today's market to be able to import existing 1-2-3 files, including both formulas and macros.

- Eventually, standards will be adopted.

  - Though IBM doesn't usually cooperate in setting standards, when they enter a market they often set a de facto standard. "Topview compatibility" is likely to become a standard for software programs.

- Another approach to standardization is to use a standard, common file design such as ASCII data codes to facilitate both the use of a single editor for all data files and file interchangeability among various applications programs.

- The advent of multiuser systems and local area networks, coupled with the large number of personal computers that will be on white collar workers' desks, means integrated software will move beyond individual activities to an automated environment, where programs and files are shared among a number of users. In the future, the capabilities of integrated software will be extended to include packages that address the productivity of groups of white collar workers.

  - Networked or multiuser integrated software packages will link together an entire office's communications and scheduling activities.

  - Examples include an electronic bulletin board, shared phone directories, and a global calendar, which can find open times on a group's on-line calendars to schedule meetings.

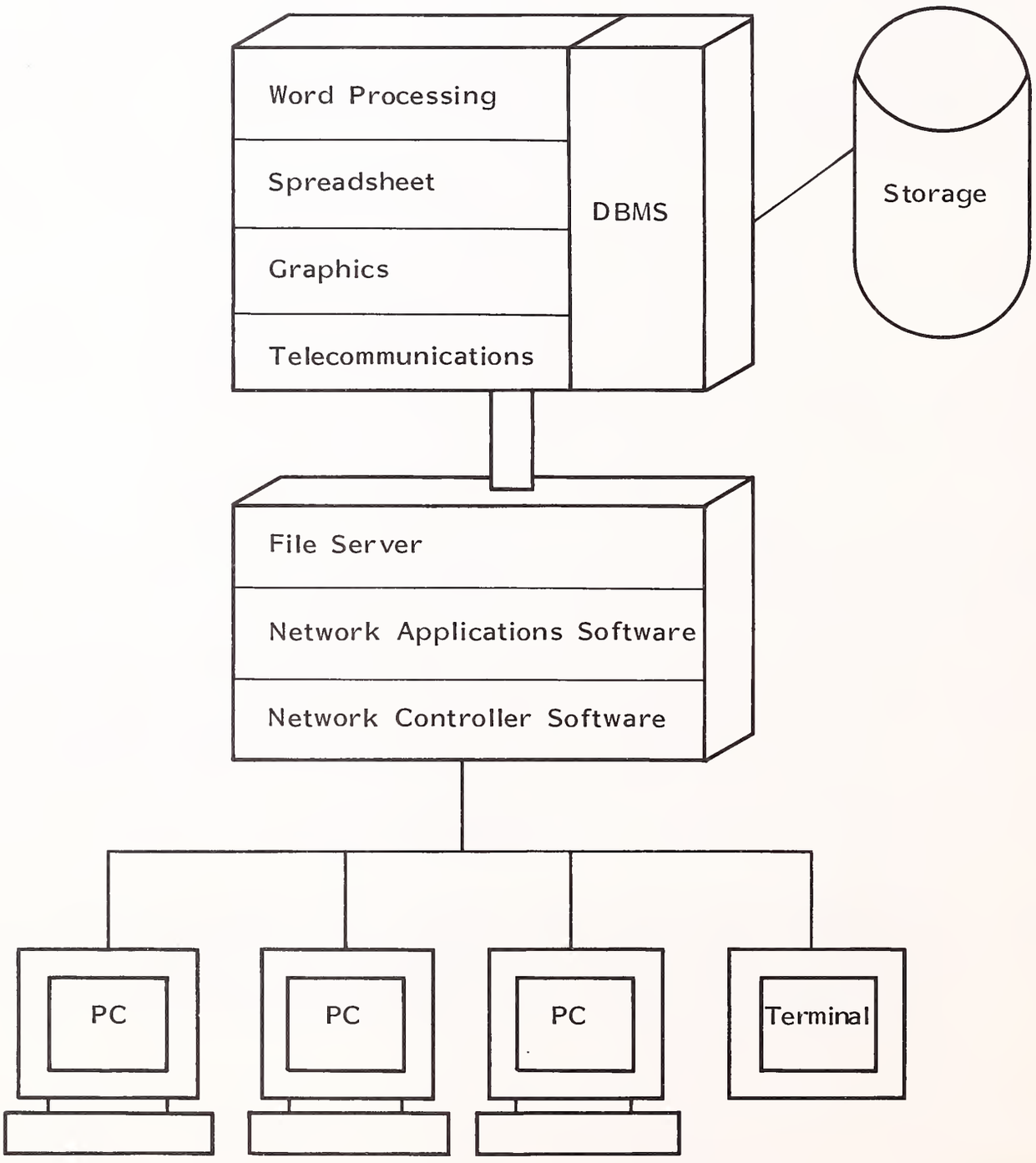
  - An integrated software package that revolves around a data base would be ideal for this type of environment.

  - Poeple on a LAN will make frequent use of a data base shared by all. If they want to transfer data from the data base to the spreadsheet or to a word processor, the data exchange capabilities of an integrated package would greatly facilitate this activity. Exhibit IV-9 shows a typical configuration for this arrangement.

- An advantage of a multiuser environment is that personal computers, acting as terminals, will be able to take advantage of the greater processing power of host systems to run more powerful integrated software--for example, DEC's All-in-1 program.

EXHIBIT IV-9

LAN VERSIONS OF INTEGRATED SOFTWARE WILL BECOME AVAILABLE



c. Vertical Market Trends

- In order to survive, many vendors must target vertical markets. A major trend is the development of templates for vertical markets. Now that users have assimilated the general purpose packages, they are looking for individual solutions to take advantage of the hardware and software they already have. Templates using existing packages provide this solution.

  - Optionware, Inc. has developed a series of templates for Lotus 1-2-3 that offer ready made applications for that product. Examples include profit and loss statement and financial analysis templates. Many more like these will be developed for products such as Symphony and Framework.

  - In fact, Lotus and Ashton-Tate are actively encouraging third-party software development for their products.

  - This type of product will greatly increase the ease of use and thus the acceptance of these products.

- Another example of an innovative vertical market package that uses another program for its core is the Softbridge Integrator from Softbridge Microsystems that serves as a sophisticated link for Lotus 1-2-3, Relational Database Systems Informix, and Multimate. The product provides a large amount of financial planning knowledge, and is targeted to financial planners. This is an example of a product that provides "artificial knowledge."

- Conversely, some packages will be easy enough to use so that the user can develop the application themselves. For example, a product like Aura (Softrend) is a powerful application development tool. Rather than buying a vertical package to which you have to fit your company procedures, Aura gives you the ability to shape the software to your business.

d. Future Generations of Products

- The only way to make integrated packages accessible to more workers is to introduce new functionality or make it easier to use. Taking existing functionality like a word processor and a spreadsheet, which don't have much of a relationship, and shoving them into the same environment doesn't lead to new uses of a computer or to increased sales.

- We're now suffering from over-integration with these all-in-one products. Many of the companies are misguidedly trying to pack too much functionality into a single package. This results in the program becoming intimidating to the user. For example, the documentation is gargantuan. This obsession with functionality is one reason Ovation, a leading "vaporware" product, never saw the light of day.

- Users don't necessarily want more functions; they already have enough--they need to be able to use what they have better. As one vendor commented, "for every feature added, there is an equal and opposite error message." Customers don't want to be dazzled; they are looking for utility. The market doesn't want unlimited integration if that makes the product too tough to use.

- The next successful trend on the horizon is going to be a host of "narrowly" integrated programs that don't attempt to do everything, but instead try to match themselves to some generally defined user work style.

- A certain amount of integration is necessary and will continue. But this will take the form of "stripped down" integration. For example, it makes sense to integrate graphics with a spreadsheet, or a data base with a word processor. An example of stripped down integration is "activity integration," the term MicroPro used to describe its new package: WordStar 2000. They offer functions that are integrated and relevant to its central module: word processing. They offer word processing in conjunction with a spelling checker and mailing list.

- Similarly, other specific packages for horizontal markets will be developed, as shown in Exhibit IV-10.

- Trends in integrated software can be described by looking at successive generations of products. Exhibit IV-11 characterizes several leading products in this way. The primary trend from each generation to the next is more power, but greater ease of use due to a graphics-oriented interface--or just better overall design.

- Some form of knowledge or intelligence will eventually become an integral part of these programs, enabling them to adapt to users by remembering the commands and sequences they have taken.

  - For example, if the user makes the same mistake more than once, the computer can prompt with a suggestion. This is similar to an intelligent error message.

  - These programs may take the form of expert systems that contain knowledge about what sort of data or information is meaningful to the user. They will be like intelligent OptionWare templates. Knowledge routines will be available that will intelligently link together different packages. Third parties will develop add-on knowledge for powerful but ignorant productivity tools.

- The next generation of software will be fully functional, but will be much easier to use. This will be a necessity if the market is to break open and have broad appeal. Currently, a new user has to go through extensive training just to be able to use a package. These training costs turn out to be a major part of the expense of using or providing computers; such costs will have to come down.

EXHIBIT IV-10

SPECIFIC PACKAGES FOR HORIZONTAL MARKETS WILL BE DEVELOPED

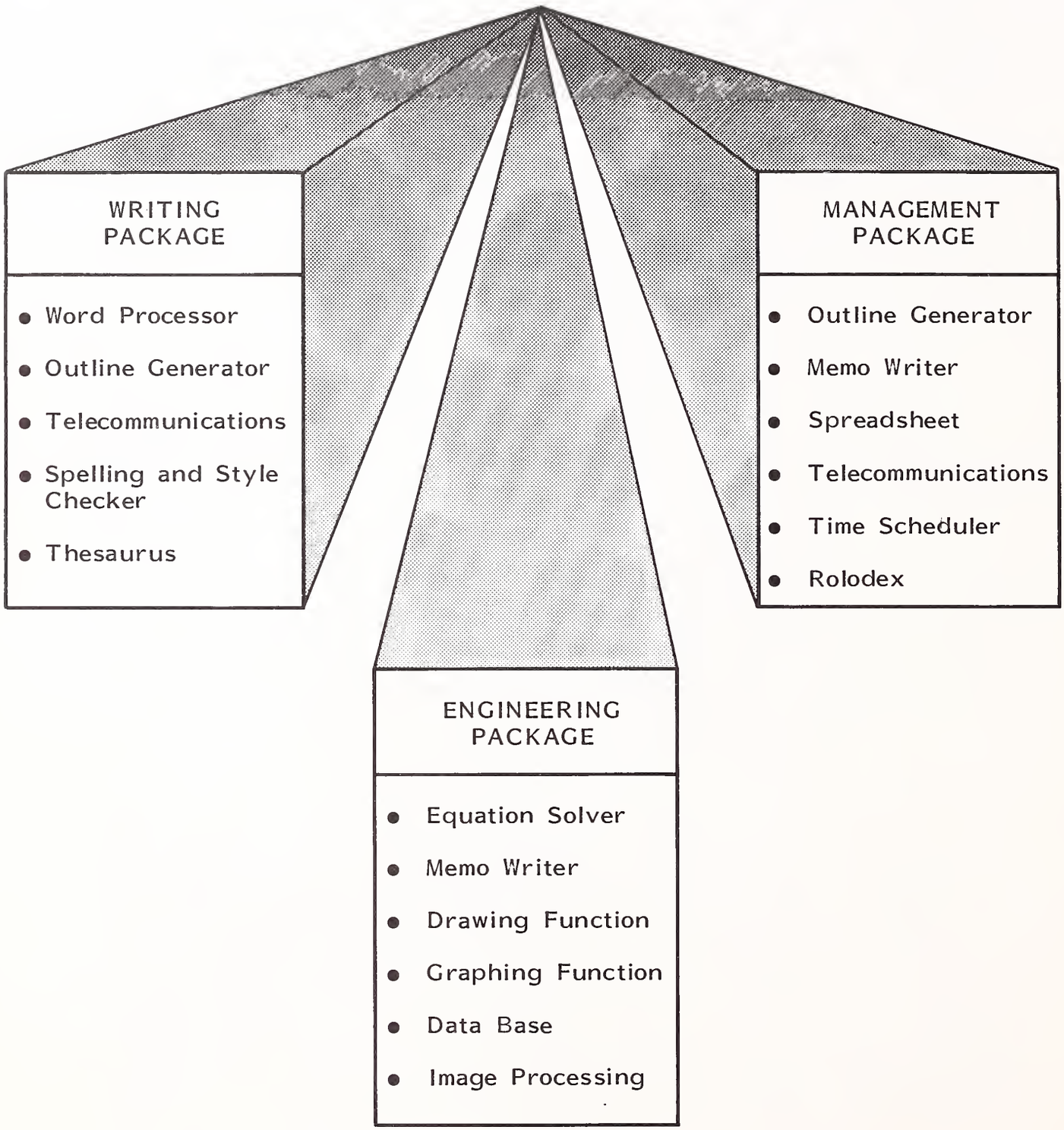


EXHIBIT IV-11

GENERATIONS OF INTEGRATED SOFTWARE

	PRODUCT	CHARACTERISTICS
First Generation	Lotus 1-2-3 Context MBA	Three Applications in One, Limited Data Transfer
Second Generation	Symphony, Framework	Five Applications in One
Third Generation	Enable, Smart Series	Fully Functional Applications, Relatively Easy to Use, Requires Only 256K
Fourth Generation	Jazz, Products Using GEM or MS-Windows	Graphics-Oriented User Interface, Much Easier to Use
Fifth Generation	Still Open!	Powerful, Easy to Use, Incorporating Artificial Intelligence Features

- Companies can expand their customer base by making products that require little or no training. But software designers face a dilemma: software that is easier to use is often less efficient and powerful than software designed for experienced or expert users.

- The user market is changing in a way that will favor products that are easier to use. Until now, it has been the innovators and early adoptors that have been doing the buying. While many current users will upgrade to more powerful integrated packages, the real growth will come from first-time users of computers. They will require easy to use software.

- Business users who don't know much about computers are by far the largest untapped market. They want programs that make their jobs easier to do, not programs that can do ever more complex jobs.

  - Today's professional does not have the time or interest to learn complicated technical terminology or extensive commands.

  - Increasing functionality increases the complexity. But newer users are marginally less skilled than the previous users. So, decreasing user skill compounds the increasing complexity problem. Ways around this problem include better interfaces or less complicated software.

  - Many of the new users of computers will also be infrequent users of the computer. This is another reason why the software must be easy to use, because the user will not want to have to remember complex commands and structures.

- The current benchmark for ease of use--and thus for success--is that a package be no more difficult to use than Lotus 1-2-3. In fact, some users still prefer 1-2-3 over Symphony because of its greater simplicity. The future ease-of-use baseline will be another Lotus product: Jazz.

- Jazz uses the Macintosh desktop model of integration as opposed to Symphony's spreadsheet-oriented integration. Jazz in its sophisticated simplicity seems to be the product Symphony should have been. It takes full advantage of the Macintosh's icons, pull-down menus and mouse technology; however, Jazz is not without its drawbacks:

  - It lacks a user programming language.

  - It is a closed system: it cannot accommodate third-party applications.

- Jazz, although a Macintosh product, will have a significant impact upon software for the PC. Jazz will set a new standard for ease of use and the user environment for integrated software. The result will be that IBM PC software will become more Macintosh-like.

- To take advantage of this visually oriented interface, new software will require the power provided by the PC-AT. There is a real opportunity to develop software for the PC-AT that incorporates features from Jazz.

- Approaches that make all-in-one packages easier to use--such as consistent interfaces, menus, the ability to switch quickly from one task to another, and intuitive approaches to data transfer between modules--are necessary if integrated software is to tap into the larger market. A better interface is crucial to bringing new people to personal computing.

- Environment, not integration, is the central question facing software developers today: the question is not what features should be offered, but what sort of environment should be provided to the user.

- Developers should concentrate on how the user interacts with the computer. They should attempt to make the interface as intuitive and comfortable as possible.

- From the users' standpoint, when using a software program:

  . They don't want to lose their train of thought.

  . They don't want to see inconsistency.

  . They want to avoid rekeying data.

- Products need menus and icons to get inexperienced users going right away, but one should also be able to bypass the menus if they aren't needed. They should offer both menu-driven and command-driven, together with a graphics orientation, in order to be competitive and meet customer demands. This combination of interface will allow first-time users to get started right away, and gives experienced users the speed and flexibility they require.

e. Technology Trends and Impacts

- The technology advances that will have a positive impact on the market growth of integrated software are listed in Exhibit IV-12.

- Today's new integrated software suffers from the IBM PC's lack of computing horsepower and acceptable graphics.

  - The PC and its clones lack important features and cannot run integrated software well. The Intel 8088 and 8086 family of central processing chips do not have memory management and thus cannot do multitasking reliably; one program can wipe out another during operation. Both types of chips run sluggishly.

  - New chips will soon be in widespread use that will provide the necessary power to run integrated applications well. Examples include the Intel 80286 and 80386, and the Motorola 68020 family of chips.

EXHIBIT IV-12

TECHNOLOGY ADVANCES THAT IMPACT INTEGRATED SOFTWARE

- More Powerful Processors
- Larger, Higher-Resolution Monitors
- Low-Cost Optical Disk Storage Devices
- Growth of LANs
- Voice Recognition Technology
- Natural Language Query
- Multitasking Operating Systems

- Larger, higher-resolution monitors will be introduced that will facilitate the use of windows and the development of graphics-oriented software.

- Affordable optical disk storage will make integrated software more convenient to use--as did hard disks--by reducing the disk swapping required. Some programs require up to six disk swaps to transfer data. This is unacceptable to many PC users. With an optical disk, users could put all of their programs on one disk, thus making the software more convenient to use.

- In the long run, LANs will become the most important communications system. Since relatively few personal computer LANs have been installed, few integrated packages now support them. However, as the installed base of LANs increases rapidly, multiuser versions of integrated software will be developed.

- Eventually, voice recognition technology will be sufficiently developed to serve as the user interface. This will replace icons and graphics-oriented interface. But powerful voice recognition technology is at least five years from being widely available on personal computers.

- Because of operating system limitations, most present integrated packages are not truly multitasking. But this will become an increasingly common feature. Integrated software will make a natural transition onto new machines running multitasking, multiuser software.

- A wave of new software will appear in order to take advantage of all the memory offered by the PC AT. A new operating system will need to be developed, however, since PC-DOS is limited to 640K RAM.

- Generic productivity applications will be put in ROM. IBM could do this very easily in the next couple of years. This would have a severe impact on other generic software vendors, because IBM could put it on every machine they

sold. IBM could get away with it because they would then encourage software developers to write vertical market software for the computer, using the built-in integrated package as a core.

- AT&T and IBM will eventually release proprietary machines that utilize custom microprocessor chips. Consequently, software developers will have to choose carefully which machines they will support.

B. PRODUCT ANALYSIS: OPERATING ENVIRONMENTS

- The advantages and disadvantages of operating environments are shown in Exhibit IV-13.

- An operating environment (such as Topview) rests atop a personal computer's operating system, allowing several programs to be run concurrently in different windows on screen.

  - Operating environments allow users to combine their favorite single application programs.

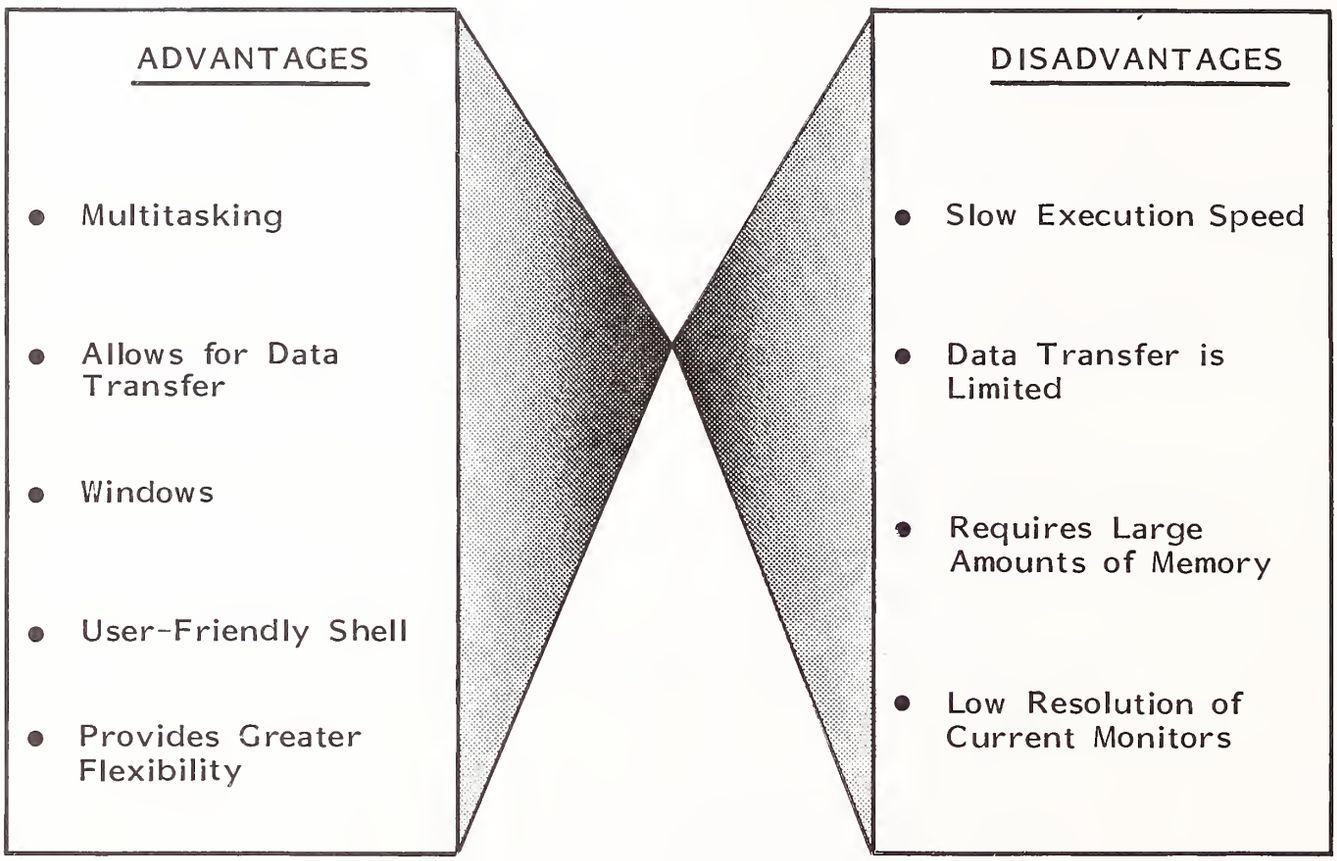
  - Consequently, the alleged advantage of operating environments is that they will provide all the benefits of integration, but will not require learning and using new software applications to accommodate this integration.

  - Thus, operating environments could thereby invalidate tightly integrated software's appeal by letting users create their own integrated systems.

- However, what sounds good in theory doesn't always work out in practice. There are numerous drawbacks to operating environments that need to be overcome before operating environments become standard.

EXHIBIT IV-13

OPERATING ENVIRONMENTS ON BALANCE



- Operating environment products can only work well with programs that are "well behaved."

- Since many existing programs do not follow the "rules" of MS-DOS, they work awkwardly or not at all, particularly with windows.

- In order to take full advantage of the Topview environment, it is necessary for applications to be designed specifically to work within Topview.

- To take advantage of the new graphics-oriented interface, the modifications must be major.

- They don't offer the same level of integration as does an integrated package. They fall short in allowing programs to share the data as well as the screen. Without a standard for data formats, this is an unlikely development. However, IBM may eventually be able to establish a de facto standard for data interchange.

- Mixing spreadsheet data with graphics on the same screen is a valuable feature that operating environments will not be able to provide as well, since they cannot link "live" information.

- Use of an operating environment provides only some of the product features available in an integrated system because there is not enough memory in most computers to load all of the packages simultaneously.

- The response time is slower because of the added layer of software.

- Today, most microcomputer screens (typically 25 lines by 80 characters) are not large enough to run more than two windows effectively. Future designs will use full-page or two-page screens.

- Because of hardware limitations, no operating environment works very well on the standard IBM PC or XT. Operating environments will have to wait for the next generation of hardware.

- For the time being, those who desire true integration must still turn to all-in-one integrated packages.

- Consequently, it will take another year or two before operating environments become widely used.

  - Topview from IBM will become the de facto standard for the interface to the hardware and software. "Topview compatibility" will be the standard, not "IBM PC compatibility."

- Operating environments will take off when they can run off-the-shelf software with little or no conversion.

  - Currently, software vendors are not rushing to make their software run under an operating environment. They are playing a wait-and-see game.

  - Eventually, most vendors will produce versions that are Topview-compatible.

C. SEGMENTATION OF THE MARKET BY TYPE OF USER

- Instead of just throwing every available application together in the same package, developers must begin developing products with a keener eye on the actual needs and work patterns of their customers. Unfortunately, understanding the needs of the users and being able to meet them are not the same thing.

- The market for integrated software can be segmented into several categories:
  - Small business versus large business workers.
  - Word-oriented versus number-oriented users.
  - Inexperienced users versus power users.
  - Vertical market users versus generic productivity tool users.
- Examples of products that fit these categories are shown in Exhibit IV-14. Each segment has different requirements for the type of package needed.
  - Since no one program is clearly best for all applications and all users, a software developer must ask: what will the program be used for, and who will be using the software?

1. SMALL BUSINESS VERSUS LARGE BUSINESS

- The majority of initial integrated software purchases come out of large corporations--they are more willing and able to take a chance, since they can afford it. In addition, corporate purchasers are less price sensitive.
  - Sales will penetrate down to the small business slowly. Small businesses are behind in their perception of the need for integrated software. They typically start out with word processing, then use a spreadsheet, then a data base manager for mail merge or to maintain customer lists.
  - These differences are reflected in the types of software they buy and how they use it. A small business will use it more for managing operations, while a large business will use it more for analytical and planning purposes.

EXHIBIT IV -14

SEGMENTATION OF INTEGRATED SOFTWARE USERS

SMALL BUSINESS	Versus	LARGE BUSINESS
Examples: Apple Works T/Maker III		Examples: Symphony Smart Series
WORD-ORIENTED	Versus	NUMBER-ORIENTED
Framework Dayflo		Symphony
INEXPERIENCED USERS	Versus	POWER USERS
Electric Desk PFS: Series		Knowledgeman Metafile Series
VERTICAL MARKETS	Versus	GENERIC PRODUCTIVITY TOOL USER
Optionware Softbridge Integrator		Majority of Current Offerings

- Small business and professional users stress ease of use: they've spent their own money, and they need to get started working and being productive with the program right away. They are impatient; consequently, they won't put up with software that is difficult to learn or use.

- A further breakdown of the needs for large business versus small business is shown in Exhibit IV-15.

2. TEXT VERSUS NUMBERS

- In brief, Symphony is for people who work with numbers, and Framework is for those who work with words. Symphony appeals to financial analysts and accountants; Framework appeals to managers and decision makers.

- A more detailed breakdown of these needs is shown in Exhibit IV-16. This matrix can be used to target the prospective users of integrated software.

3. INEXPERIENCED USER VERSUS POWER USER

- There are two major categories of integrated software products: one group is sophisticated and hard to use; the other group is less functional but easier to use. They appeal to different markets.

- The market for many of the fully functional all-in-one packages is clearly the power user, that is, the experienced user who uses the computer on the job extensively.

  - However, many power users prefer to pick and choose to find the best applications for their needs. In addition, power users make up only a small percentage of total computer users.

EXHIBIT IV-15

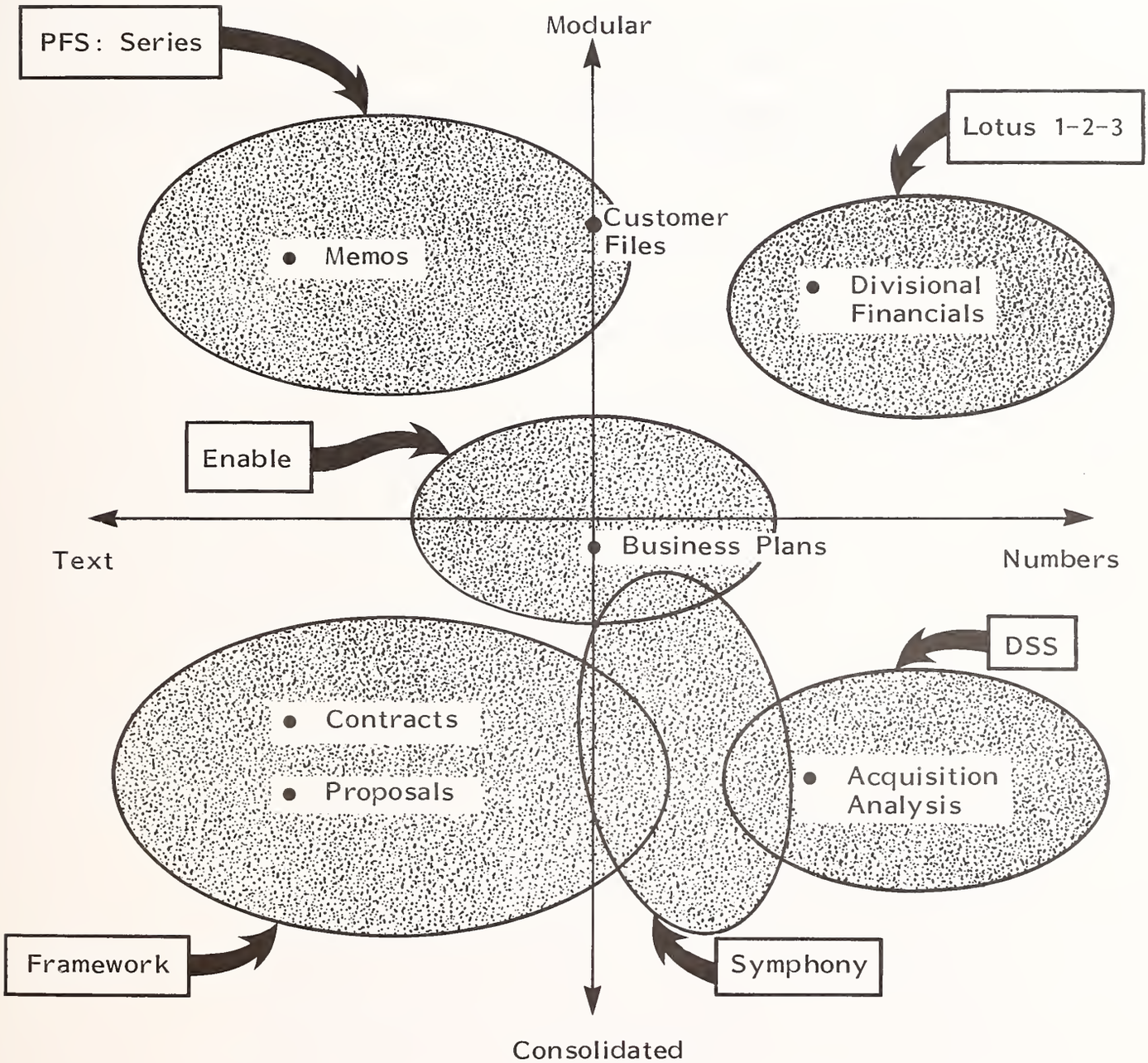
LARGE BUSINESS VERSUS SMALL BUSINESS NEEDS FOR INTEGRATED SOFTWARE

LARGE BUSINESS	SMALL BUSINESS
• Fully Functional Modules	• Easy to Use and Install
• Price Not a Major Factor	• Inexpensive
• Mainframe Connectivity	• Flexible Enough for Applications Development
• Multiuser Versions for Networks	• DBMS as Central Module
• Full Customer Support	• Minimum Hardware Configuration

Large Business : > $10 Million
Small Business : < $10 Million

EXHIBIT IV-16

BUSINESS APPLICATIONS POSITIONING MATRIX



- The vast majority of users, in whose sector all the growth in the market will take place, are first-time and relatively inexperienced users, but very sophisticated in terms of what they want the computer to do for them.

  - Beginners are likely to buy tightly integrated software, because they don't have any software yet that they want to retain.

  - Conversely, since it is unlikely that many of these relative novices will need to run several applications (at least initially), they may prefer to buy one application at a time, thus preferring to integrate by using an operating environment.

V COMPETITIVE ANALYSIS

A. LEADING VENDORS OF INTEGRATED SOFTWARE

- Currently the integrated software market is dominated by one vendor: Lotus.
- The market is very fragmented once one looks past Lotus.
- Most of the sales estimates of the leading vendors are for six months of sales or less, since many vendors did not release their package until halfway through 1984.
- Shipment rates and revenue figures for the top 12 vendors are shown in Exhibit V-1.
- Underlying assumptions for these figures are given in Exhibit V-2.
- Leading vendors for the various types of products are listed in Exhibit V-3.
    - The list includes vendors that offer a product distinguishable from the typical, tightly integrated package. For example, while an integrated micro-mainframe software product may be similar to Framework or Symphony, the micro-mainframe products are clearly targeted to users that require links to the mainframe.

EXHIBIT V-1

BEST-SELLING INTEGRATED SOFTWARE PRODUCTS
(U.S. Business Market)

PRODUCT	VENDOR	1984 SHIPMENTS	1984 REVENUES ($ Millions)
Lotus 1-2-3	Lotus Development Corp.	440,000	$110.0
Symphony	Lotus Development Corp.	100,000	30.0
Appleworks	Apple Computer	50,000	7.5
Framework	Ashton-Tate	45,000	15.0
Super Calc 3	Sorcim/IUS	25,000	5.0
Knowledgeman	Micro Data Base Systems	21,000	7.0
Smart Series	Innovative Software	13,000	4.0
Enable	The Software Group	10,000	3.0
Electric Desk	Alpha Software	10,000	3.0
Context MBA	Context Management Systems	8,000	2.4
Decision Manager	Peachtree Software	7,500	2.3
Goldengate	Cullinet	5,000	2.0
Other		35,500	11.0
Total		770,000	$202.2

EXHIBIT V-2

NOTES FOR EXHIBIT V-1

- List includes vendors of tightly integrated products only.

- Estimates are for U.S. business sales only. Thus, only a fraction of the sales of Appleworks is listed because the primary market for the product is home and education.

- Revenue figures are for vendor revenues, not user expenditures.

  - If a vendor sold to a distributor who then sold to a retailer, then a 40-20-40 split respectively of the retail selling price was assumed.

  - However, some vendors were able to command a greater split. For example, Lotus was assumed to have received a 50% split for Lotus 1-2-3.

  - Other exceptions include Apple, which bypasses the distributors and sells directly to retailers, and companies such as Cullinet, which sell directly to corporations.

EXHIBIT V-3

LEADING VENDORS OF INTEGRATED SOFTWARE BY PRODUCT CATEGORY

CATEGORY	COMPANY	PRODUCT
Leading Vendors of Modularly Integrated Software	• IBM • Software Publishing Corp. • Innovative Software	• Personal Decision Series • PFS: Series • Smart Series
Leading Vendors of Operating Environments	• Quarterdeck Office Systems • IBM • Digital Research	• Desq • Topview • GEM
Leading Vendors of Integrated Decision Support Systems	• Comshare • Ferox Microsystems	• Micro W • Encore
Leading Vendors of Integrated Micro-Mainframe Products	• Cullinet • Computer Associates • Informatics General • Context Management Systems	• Goldengate • CA: Executive • Answer Series • Corporate MBA

- An evaluation of the performance of the various integrated software vendors is shown in Exhibit V-4.

B. WHO THE WINNERS AND LOSERS WILL BE

- The concept of integrated software is a good one, but the execution has been poor. Succeeding generations of improved integrated software will meet with better success. Currently, there are drawbacks to every program on the market; there is no perfect program. However, just about every program has its strong feature. Eventually, each of these strong points will be combined into one stellar program.

- A major vendor such as Lotus or Ashton-Tate has the necessary money and staff to go back to the drawing board to produce a much improved product.

- There are too many companies doing the same thing, and there is not enough shelf space. Effective marketing is critical in this situation. A product must be differentiated, offering something that can't be found in another brand.

  - There is still room for a few newcomers, but they must either be an already well-established vendor or they must offer a very innovative product, one that addresses a readily apparent need. New vendors must offer substantial improvement in the product if they are to succeed.

- But, product innovation is no longer enough to ensure success. There is a saturation of distribution channels.

  - Because the distribution channels are already clogged, it will be difficult for new vendors to break in or for struggling vendors to continue to survive. To stay afloat, vendors are developing innovative marketing methods and are selling directly to corporations or to end users.

EXHIBIT V-4

PERFORMANCE RATINGS OF INTEGRATED SOFTWARE VENDORS

CLASSIFICATION	COMPANY	PRODUCT
Market Successes	• Lotus Development Corp. • Apple Computer • Software Publishing Corp.	• Lotus 1-2-3 • Appleworks • PFS: Series
Market Failures	• Ovation Technologies • Business Solutions • Visicorp	• Ovation • Jack 2 • Visi On
Moderately Successful but Disappointing Performers	• Lotus Development Corp. • Ashton-Tate	• Symphony • Framework
Companies with the Best Chance for Success	• Lotus Development Corp. • IBM • The Software Group • Innovative Software	• Jazz (and future releases) • Next Generation of Topview and Personal Decision Series • Enable • Smart Series

- The battle for dealer shelf space and user "mindspace" intensifies. Getting attention for your product in this market is not easy. Companies need a critical mass of people, visibility, and money in order to squeeze through the retail funnel or to bypass it.

- The strengths and weaknesses of leading integrated software products are listed in Exhibit V-5.

- Despite a growing market and increased demand for integrated software, plenty of vendors will fall by the wayside. IBM is guaranteed a place at the table by its sheer size; however, it is by no means guaranteed the largest portion of the market when it comes to software. Sales have been sluggish for their Personal Decision Series, and Topview will not be a big seller right away.

  - IBM software sales through retail will not be a huge success for the near future; however, they should do well in Fortune 1000 accounts, where they will get the attention of IS directors.

  - IBM will very likely release their own tightly integrated software package. They may bundle it with the lap top computer they are expected to release in mid 1985.

- The success of Appleworks shows that an integrated product can be very successful. The key to Appleworks' success is that it is easy to use, as well as being as functional as the standalone products it competed against. However, Appleworks is not very well suited to serious business use.

- The characteristics of winners in the integrated software market are summarized in Exhibit V-6.

EXHIBIT V-5

STRENGTHS AND WEAKNESSES OF
LEADING INTEGRATED SOFTWARE VENDORS

COMPANY	STRENGTHS	WEAKNESSES
Lotus	• Programs Have Flexibility, Programmability • Extensive Financial Resources • Third-Party Support • De Facto Spreadsheet Standard • Agreements with Innovative Spin-Offs	• Company Size may Prove to Be Unwieldy. • Stuck with Spreadsheet as Model for Integrated Software
Ashton-Tate	• Innovative, Well-Designed Product • Extensive Advertising • Established Distribution Channels	• Unfocused Marketing • Product Lacks Power vis-a-vis Major Competitors • Targeted Market of Word-Oriented Computer-Using Managers Is Still Limited
The Software Group	• Innovative Product • Effective Advertising • Well Reviewed in the Trade Press • Seems to Have Caught the Attention of Corporate America	• Small Private Company

EXHIBIT V-5 (Cont.)

STRENGTHS AND WEAKNESSES OF LEADING INTEGRATED SOFTWARE VENDORS

COMPANY	STRENGTHS	WEAKNESSES
IBM	• Largest Hardware Vendor • Unparalleled Financial Resources • IBM Reputation for Stability and Dependability. • Can Afford to Make a Mistake and Recover	• Still has not Demonstrated the Ability to Develop Innovative, High Quality Software • IBM Reputation in Hardware may not Carry Over to Software, Especially for End Users
Innovative Software	• Public Company • Powerful Product • Experienced Management	• Not Fully Integrated Package • Product has so Many Features that It May Be Intimidating to Users

EXHIBIT V-6

CHARACTERISTICS OF WINNERS IN THE INTEGRATED SOFTWARE MARKET

Winners Today

- Offer Innovative Products
- Got Their Names Out Early
- Have Broad Distribution Channels
- Attract Third Party Support

Additional Requirements for Winners in the Future

- Provide Easy to Use Yet Powerful Software
- Provide Flexibility and Connectivity
- Possess Strong Development Resources
- Have Depth of Management
- Positioned on Both Sides of the Micro-Mainframe Link
- Target Market Carefully

VI CONCLUSIONS AND RECOMMENDATIONS

A. RECOMMENDATIONS

- A summary of recommendations for marketing products is contained in Exhibit VI-1.

- A summary of recommendations for developing products is shown in Exhibit VI-2.

  - Don't design a package that is all things to all people. It can't be done.

  - Pinpoint the specific groups most likely to use the program--the early adopters--and sell an innovative product to those people who most immediately need it. You can expand your customer base to include the larger market after that.

  - Have a clear idea of your targeted market. For example, Software Publishing Corporation concentrates on first-time users. Alpha Software is using a similar approach.

  - Package integrated products in combinations of modules that would appeal to target markets. For example, packages for financial planners or engineers.

EXHIBIT VI-1

RECOMMENDATIONS FOR MARKETING PRODUCTS

- Exploit vertical market opportunities.
- Pinpoint the early adoptors: the specific groups within a segment that are most likely to buy the product.
- Add innovative links or modules - but first make sure that current customer needs are being met.
- Offer an upgradeable product line, i.e., one for novices, and one for experienced users.

EXHIBIT VI-2

RECOMMENDATIONS FOR DEVELOPING PRODUCTS

- Anticipate marketplace shifts. Be able to take advantage of new generations of hardware.
- Watch IBM.
- Make alliances with leading vendors.
- Provide easy to use software combined with power.
- Provide connectivity and flexibility

- Right now the PC is used as a productivity tool. We are at the crest of that wave. The next wave will be PCs used as a communications tool. Be prepared to ride that wave. Develop new products or capabilities to take advantage of this trend.

- Provide for connectivity and flexibility. Offer the flexibility to be able to easily incorporate new applications or new programs into the existing package.

  - Develop links to the computing environment, such as micro-mainframe links or networking capabilities. Offer them yourself or work with another vendor to offer them.

  - Increase flexibility by offering convenient hooks to other programs, i.e., accounting packages or Lotus 1-2-3 files.

  - Increase extendability by encouraging add-in software from third-party vendors.

- Performance and features are only part of a successful package. Support, marketing, and timing may be more important.

- Instead of stressing features, stress the environment.

  - Don't build in new design enhancements that will adversely affect ease of use.

- Establish partnerships with other software firms, i.e., accounting system vendors.

- A vendor must be more than a one-product company to prosper over the long haul.

- Take advantage of new technologies.

- There are numerous methods for acquiring or developing integrated software products, as Exhibit VI-3 shows. It is certainly feasible to work with other companies to develop a product.

  - Two spinoffs from Lotus have emerged that will deal with applying artificial intelligence to integrated packages such as 1-2-3 and Symphony. The two companies are Arity Corporation and Iris Associates Inc. Arity is working on a new type of business software for personal computers that incorporates artificial intelligence. Iris has an agreement for joint development of a new line of integrated business software, which is scheduled to roll out in 1986. Lotus has provided at least $1 million to Iris for product development. In return, it gets exclusive rights to license, market, and support Iris products.

  - Similarly, Forefront developed Framework for Ashton-Tate. Ashton-Tate is now negotiating to exercise an option to purchase Forefront.

B. CONCLUSIONS

- A summary of the conclusions regarding integrated software is shown in Exhibit VI-4.

- Most of the productivity gains promised by integrated software lie ahead. Greatly improved products will be released in the future.

- Rapid advances in technology will create opportunities for new software products.

EXHIBIT VI-3

METHODS FOR DEVELOPING OR ACQUIRING
INNOVATIVE INTEGRATED SOFTWARE PRODUCTS

METHOD	EXAMPLE
• Spin-Offs	• Arity and Iris Were Spawned by Lotus
• Internal Development	• Lotus with Jazz and Symphony
• Acquisition of Company	• BPI Systems acquired Softrend
• Joint Venture	• Apple with Haba Systems
• Remarket Other Vendors' Software	• IBM with Software Publishing Corp.
• Publish Another Developer's Product	• Ashton-Tate with Forefront; Electronic Arts
• Purchase Rights to Another Vendor's Source Code	• Cullinet with Micro Data Base Systems

EXHIBIT VI-4

THE FUTURE OF INTEGRATED SOFTWARE

- The new generation of integrated software awaits the next generation of hardware.
- Excellent opportunities are available for those vendors who can adapt to the changing market.
- Integration in one form or another will be standard by 1990.
- Integrated software products will have to be more narrowly focused in order to succeed.
- Integrated software must become easier to use if it is to penetrate the mass market.
- The concept of integrated software is valid and appealing.
- The tightly integrated modular approach will be most successful; that is, flexibility plus integration equals success.
- Products integrated around a central data base represent the wave of the future.
- New software written for the graphics-enhanced PC AT will be very successful.
- Multiuser versions of integrated software will experience heavy demand.

- The holy grail of integrated software is power and flexibility combined with ease of use.

- The software market moves so quickly that the windows of opportunity are narrowing. A product that takes two years to develop may only have a product life of six months. As often happens, as soon as a product is out, it's obsolete.

- No one vendor is going to be able to produce the ultimate application of each type. One vendor can't be all things to all people.

- Since no one package meets the needs of every user, there is an opportunity to develop products that meet the needs of different types of users.

- High-end and low-end packages will be more clearly differentiated. High-end products will run on the most powerful microcomputer and offer state of the art in functionality. Low-end products will be easier to use, offer less functionality and will run on standard IBM PCs.

- Once people start using computers, they are likely to use them for greater numbers of applications, and when they do, they are unwilling to learn new programs and commands every time. This will stimulate demand for integrated software.

- Reasons for negativism in the market include:

  - Slowing of microcomputer hardware growth.

  - Current products are difficult to use.

  - Limited capabilities of present day microcomputers.

- There is a trend toward the tightly integrated combined with the modular approach; i.e., if Enable sold individual programs separately, or if the Smart Series were a little more fully integrated.

- The two types of integrated software that will dominate the software market are the modular but tightly integrated packages, and the operating environments. The two forms will ultimately be compatible; a tightly integrated package could run as part of an operating environment. Alternatively, integrated software will take on some of the characteristics of the operating environments.

- Many people assume that people will link their favorite programs using Topview. It would be fine if it worked. But what sounds good in theory doesn't always work out in practice. Software vendors must write or adapt their programs to run under it. When they do, then Topview will be a success.

- Those people who need tight integration (managers, analysts, researchers), will use an all-in-one package, able to incorporate the leading packages into their environment.

- More packages will come out that are designed for a particular segment of the market, and so those users will need to pick and choose the pieces that they want. In this case, either modular programs or programs integrated with an operating environment will be the most successful. On the other hand, the next generation of integrated software will be much more intelligently designed, so that the current limitations will disappear, and the inherent advantages of integrated software will finally appear.

- For the next two years, a well-designed integrated package will offer advantages over operating environments. However, within two years, all software will be designed or adapted to run under a standard operating environment. If this is the case, then an operating environment will offer most, if not all, of the advantages of an all-in-one package.

APPENDIX A: LIST OF LEADING VENDORS AND PRODUCTS

- Exhibit A-1 contains information on the leading tightly integrated software vendors and programs.

APPENDIX A

LEADING INTEGRATED SOFTWARE VENDORS AND PRODUCTS

PRODUCT	MANUFACTURER	MODULES
Appleworks	**Apple Computer** 20525 Mariani Cupertino, CA 95041 (408)996-1010	Spreadsheet Word Processing Data Base Manager
Aura	**Softrend (Subsid.of BPI Systems)** 2 Manor Parkway Salem, NH 03079 (603) 898-1896	Spreadsheet Word Processing Data Base Manager Graphics Add on: Communications
Decision Manager	**Peachtree Software, Inc.** 3445 Peachtree Road, NE Atlanta, GA 30326 (404)239-3000	Spreadsheet Word Processing Data Base Manager Graphics Communications Micro-Mainframe Link
Electric Desk	**Alpha Software** 30 B Street Burlington, MA 01803 (617)229-2924	Spreadsheet Wrrd Processing Data Base Manager Communications
Enable	**The Software Group** Northway Ten Executive Park Ballston Lake, NY 12019 (518)877-8600	Spreadsheet Word Processing Data Base Manager Graphics Communications
Framework	**Ashton-Tate** 10150 West Jefferson Blvd. Culver City, CA 90230 (213)204-5570	Spreadsheet Word Processing Data Base Manager Graphics Communications Outline Generator
Knowledgeman	**Micro Data Base Systems, Inc.** P.O. Box 248 Lafayette, IN 47902 (317)463-2581	Spreadsheet Word Processing Data Base Manager Graphics Statistics Report Generator
Smart Series	**Innovative Software** 9300 West 110th Street Overland Park, KS 66210 (913)383-1089	Spreadsheet with Graphics Date Base Manager Word Processing
Symphony	**Lotus Development Corp.** 161 First Street Cambridge, Mass 02142 (617)492-7171	Spreadsheet Word Processing Data Base Manager Graphics Communications Add Ons: Outline Generator Spelling Checker
20/20	**Access Technology** 6 Pleasant Street South Natick, MA 01760 (617)655-9191	Spreadsheet Text Processnng Data Base Manager Graphics Communications Scheduling

LEADING INTEGRATED SOFTWARE VENDORS AND PRODUCTS

COST	DATE AVAILABLE	COMMENTS
$250	February 1984	Best Seller for the Apple II Series Primarily for Home and Education Markets.
$595	May 1984	Has an Application Developer that Allows Customization
$625	June 1984	Targeted to the Executive; Works with Peachtext 5000
$345	June 1984	Easy to Use, but Limited Functionality
$695	November 1984	Elegant Design; Integrated by a Master Command Module; Considered Best of the Bunch; Multiuser Version will Be Available
$695	July 1984	Organized by an Outline Generator
$500	May 1983	Powerful, High-End Product; Very Flexible; Difficult to Learn
$895	August 1984	Modularly Integrated, Can Be Purchased Separately or Together
$695	July 1984	Based on a Spreadsheet; An Expanded 1-2-3
$495	June 1984	Moves Data Between Different Sizes and Brands of Computers, Programs, and Operating Systems

INTEGRATED SOFTWARE VENDOR QUESTIONNAIRE

INPUT, a research and consulting firm, is conducting a study of the present state and future direction of personal computer integrated software packages. We would like your company to be represented in this study by having you describe the products you are now selling. I'd also like to discuss with you some trends in this market.

In return for your participation in this study, we will send you a summary of this study upon its completion.

1. PRODUCT INFORMATION

What integrated software products do you currently offer?

_____

What are their prices? _____

2. FUNCTIONS TO BE INTEGRATED

What types of integrated software do you think will be offered in the future?

_____

_____

What new functions or applications do you think will be integrated in the future?

_____

_____

How will these products be differentiated? (functionality, price, targeted user?)

_____

_____

How do you think <u>your</u> product will evolve in the future?

_____

_____

Why? _____

_____

3. FUTURE TRENDS

What sort of market or future do you see for:

All-in-one packages?

Modular integrated packages?

Operating Environments?

4. TECHNOLOGY TRENDS

What technology advances will effect the demand for integrated software? Examples: AI, SW in ROM, 32-bit processors, portables.

5. COMPETITIVE INFORMATION

Who are your top three competitors in the integrated software marketplace?

Can you estimate what their market share is?

Which vendors do you think will be most successful? Why?

6. MARKET FORECAST INFORMATION

What were your revenues for integrated software products in 1984?

_____

What were your total revenues for 1984?

_____

How many units did you ship in 1984?

_____

Can you estimate your share of the integrated software market?

_____

How many employees did you have at the end of 1984?

_____

7. MICRO-MAINFRAME LINKS

Do you have any plans to offer or establish a micro-mainframe link for your products?

_____

_____

_____

8. STRATEGIC ISSUES

What are the key issues a company needs to address in the integrated software marketplace?

_____

_____

Has your company established alliances with any other firms to develop or market software for this market?

_____

_____

_____

9. MARKET SEGEMENTATION

How does your company segment the market – e.g. Fortune 500 versus small business?

Do you target specific industry markets?

Will integrated software be developed for vertical markets? How successful will they be? What types?

Do you target specific types of users (e.g. analysts, financial planners, managers, etc.)?

MISCELLANEOUS QUESTIONS:

What new opportunities can you identify in this market?

Will integrated software have to become easier to use before it is a big success?

Thank You!

APPENDIX C: RELATED INPUT REPORTS

- Decision Support Systems and Beyond.
- Integrated DBMS-Application Software.
- Micro-Mainframe: Personal Computer Market Opportunities.
- Pricing and Distribution of Personal Computer Software.
- Trends in Operating Systems.
- U.S. Personal Computer Software Markets, 1984-1989.

About INPUT

INPUT provides planning information, analysis, and recommendations to managers and executives in the information processing industries. Through market research, technology forecasting, and competitive analysis, INPUT supports client management in making informed decisions. Continuing services are provided to users and vendors of computers, communications, and office products and services.

The company carries out continuous and in-depth research. Working closely with clients on important issues, INPUT's staff members analyze and interpret the research data, then develop recommendations and innovative ideas to meet clients' needs. Clients receive reports, presentations, access to data on which analyses are based, and continuous consulting.

Many of INPUT's professional staff members have nearly 20 years' experience in their areas of specialization. Most have held senior management positions in operations, marketing, or planning. This expertise enables INPUT to supply practical solutions to complex business problems.

Formed in 1974, INPUT has become a leading international planning services firm. Clients include over 100 of the world's largest and most technically advanced companies.

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